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Mid-century Lily 'Enchantment'

PHOTO BY: CAMPUS STUDIOS

Lilies in the Border

CLAUDE L. SHRIDE*

WITH more than fifty species and varieties of lilies on the market, besides many more hybrid clones and strains, any gardener can choose lilies to fit almost any situation. Any one who has success with the common perennials may expect little difficulty with at least twenty lily species and twice as many hybrids. These may be practically any color except blue and will vary in size from one foot to eight feet tall with flowers from one inch in diameter to one foot. They will bloom from late May until frost.

Most of you have a perennial border now established and will plant lilies in that instead of making a new lily border. If you have a border 100 feet long you can easily improve it with a hundred lily bulbs without disturbing any existing plants. Then you need not disturb the lilies for three or four years. Mark the places now where you can dig a hole a foot deep and eight inches wide. Study the neighboring plants and choose lilies that will not offer competition. Many lilies, among which are *L. Davidii, L. pumilum* and *L. regale,* have slender stems and narrow leaves so that they are scarcely noticed until ready to bloom. When the blooms fade cut off the flower head to prevent seed-setting and they will ripen for next year's performance as unobtrusively as they grew.

If you want harmony in your planting, you may time your lilies to bloom with delphiniums, thalictrums, pyrethrums, gypsophila, phlox, etc. At their feet plant something like violas or sweet alyssum. Plant lilies near what you have. Just choose a lily to suit the location.

Some pleasing combinations are: for early June, *L. pumilum* (red) or *L. amabile* (red with black spots) with *Campanula carpatica,* blue flax or yellow *Thermopsis*. For late June, *L. Martagon album* with blue flax and red coral bells *(Heuchera)*. For July first, *L. croceum* and tiger lily hybrids like 'Enchantment' (see cover picture) or 'Redbird' with white delphinium, red bee balm, yellow *Anthemis* or white and blue *Campanula persicifolia*.

Most of us must garden on a rectangular lot that is too small. All too often we settle for a green lawn with a flower border, but lilies and evergreen shrubs can build up that border with several focal points of interest so that the lawn becomes only something to cross in order that we may admire the border planting.

Horizontal fence members are good background for lilies. If you plant tall-growing lilies nearest the fence, horizontal boards will "pull them down." Do not plant lilies (or anything else) near a hedge like privet or laurel. If your fence is of pickets or grape stakes try to hide it with evergreen shrubs and plant lilies among them or in front.

Lilies thrive with rhododendrons, azaleas and most low-growing *Ericaceae* because they have similar soil requirements. A few lilies prefer lime but most of them thrive in a well drained, woodsy soil. Also, which is important, neither should be watered in late summer. Low evergreens will protect early growing lilies from late frosts and shade their root-run from hot summer sun. The roots of shrubs and other plants help to keep the ground in good mechanical condition and keep water moving.

Now, will someone who is planning a new border PLEASE make a lily border with shrubs instead of a perennial or herbaceous border? Have you wished that you could do less work on your border? Lilies and shrubs will cut maintenance in half—and make your neighbors envious. It is not difficult and has been done with gratifying results. If you plant only a few lilies you can adapt this information. They must have drainage. Dig a hole a foot and a half deep and fill it with

*Mr. Shride is one of our leading lily growers and enthusiasts in the Puget Sound area. We appreciate this very practical article, in good time for fall planting.

water. If any remains after half an hour that is not for lilies. If your subsoil is porous, open the bed two feet deep. Most lilies should be covered three times the diameter of the adult bulb. Large bulbs such as *L. speciosum* or Aurelian Hybrids should have the base eight to ten inches below the surface. They bear stem roots above the bulbs. Add a foot for the base roots to grow in—and they can use more. Place sod, humus or top soil in the bottom foot of the excavation. Mix some fertilizer with it. Add a few inches of garden soil and place the lily bulbs on that. Never set lily bulbs in contact with fertilizer. Small lilies should be planted a foot apart. Larger ones need more room so there will be space for flower heads. Label the lilies and mark places for the companion plants. Fill with garden loam, incorporating some sand if your soil is heavy or a little peat moss if it is sandy. Water well as soon as planted so there will be no air pockets around the bulbs.

If your garden is nearly level with an impervious subsoil the lily bed should be raised so that the bulbs will be above the ground level. Eight to ten inches is about right. Even the so-called bog lilies will not survive standing in stagnant water.

Most of the local garden stores stock a limited number of lilies. There are several specialists who publish descriptive catalogs which will supply the information you need to make an intelligent planting plan. The Puget Sound Lily Society meets in the Arboretum Clubhouse the second Monday evening of each month. They have a good library and will provide speakers for garden groups.

The following named lilies are of reasonably easy culture and will provide good variety in your planting. All have been growing in Puget Sound gardens for several years. They are listed in order of blooming, which varies with seasons and locations. *L. rubellum* begins blooming in late May, *L. regale* the first of July, *L. speciosum* about the first of August. The approximate height of each is given and color of flower. More information may be obtained from the sources given

Mid-century Lilies from left to right: Harmony, Enchantment, Cinnabar, Prosperity.

FIG. 6 PHOTO BY: HERMAN V. WELL

above. Try these:

L. rubellum; two feet, small pink trumpet.

L. pumilum; two feet, small red, reflexed.

L. pumilum 'Golden Gleam'; yellow form of above.

L. monadelphum; four feet, straw colored reflexed trumpets.

L. Martagon; four feet, small reflexed, white to purple.

L. columbianum; four feet, local "wild tiger." 'Mega'; (Hybrid); three feet, upward facing, canary yellow with spots.

L. croceum; three feet, upward facing, orange to red.

L. hollandicum hybrids; three feet, upward facing, yellow, orange and red. Tiger hybrids ('Redbird', 'Valiant', 'Enchantment', etc.) four feet, red.

L. Parryi; four feet, yellow trumpet.

L. pardalinum; four feet, recurved orange to red.

L. regale; four feet, white trumpet. Bellingham hybrids; five feet, cadmium yellow variously spotted maroon.

L. candidum (Madonna); five feet, white trumpet. Cover no more than two inches deep. Plant in August.

L. testaceum; five feet; reflexed, buff color.

L. Davidii; five feet, small spotted red, recurved.

L. Maximowiczii var. unicolor; five feet, reflexed red, no spots.

L. Leichtlinii; five feet, yellow with maroon spots.

L. cernuum; two feet, small reflexed, lilac colored, spicy fragrance.

L. centifolium and its hybrids; five to eight feet, white, pink and yellow trumpets.

L. Henryi; five to eight feet, orange recurved flowers. Especially good in shrubbery. Aurelian hybrids; This showy group is based on crosses of *L. Henryi* pollen on *L. Sargentiae* and *L. sulphureum*. They have been recrossed until there is a great variation of colors and shapes. They grow from four to eight feet tall with trumpets from white through yellow and orange to copper. The blooms may be bowl-shaped, reflexed, or flat with recurved tips. Blooming in late July and early August they fill a very definite need for color in the garden when good flowers are scarce. Try Sunburst hybrids, Golden Harvest hybrids, Golden Trumpets, or the apricot colored 'Inca Princess,' Golden Splendor Strain or 'Limelight.' The bowl-shaped Heart's Desire Strain, 'Flares,' 'Autumn Glory' (apricot) or 'Moonlight' (pastel) are good. Other well-known clones are 'Bright Star,' 'Good Hope,' and 'Bright Cloud.'

L. speciosum; four feet, large recurved white to pink blooms.

L. auratum; five feet, the Japanese gold band lily.

L. Parkmannii hybrids; these are very showy new crosses between *L. auratum* and *L. speciosum,* six feet tall with large flowers from white to red. Try 'Allegra,' 'Advance' and 'Aurora' (clones) and Centennial hybrids or Jamboree Strain. 'Jillian Wallace' has been available for several years.

To choose the shrubs for planting with lilies, you would do well to visit our Arboretum. Azalea Way and Rhododendron Glen

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Collection of Fiesta, Bellingham and Trumpet Lilies.

FIG. 7 PHOTO BY: HERMAN V. WELL

How to Increase Heathers

MRS. PATRICK CUMMINS*

HEATHERS are among the most easily propagated shrubs and are ideal for the beginner to try. Cuttings are the most common means of propagation for all the heathers, but layering, division, and seeding may be done.

Cuttings

When taking cuttings, choose a healthy plant from which to get your material. The ideal time for this is during the summer, usually about mid-July, when the new growth is half-ripened, the stems are changing from green to brown, and will snap clean when bent sharply. However, cuttings taken from August to November, and also in March or April, when most heathers receive their annual trimming, will root easily.

Choose the non-flowering tips, ½ to 1½" long; remove any flower buds if they do occur. Tree heath cuttings may be up to 3" long. A tip already branched will develop faster into a small plant. Either heel or stem cuttings are satisfactory. Trim the end of the cutting with a sharp knife, then strip the needle-like leaves from the lower half or third of the cutting with two fingers. Dampen and dip the bare stem in a rooting hormone; shake off the excess. *Cassiope* species require slightly different treatment; take heel cuttings in April, immediately after flowering; do not remove any leaves, and use no hormone. Do not cover with plastic.

An effective rooting medium may be made of two parts clean, sharp sand, and one part peat moss. The sand must be clean of all foreign matter. You may place a bucket or two of sand in a wheelbarrow and wash it under high pressure from the garden hose, draining off the water repeatedly until it is clear. Firm the rooting medium two to four inches deep in a shallow cedar flat lined with a single sheet of newspaper, or you may use a perforated cottage cheese carton, plastic or clay pots. Water the medium well and slice it one inch deep in rows one inch apart, with a table knife. Place the cuttings one-half inch apart in the slit, only the bare stems in the medium. Press it firmly around the base of each cutting (this is very important), then water with a gentle spray. If there is any delay in setting the cuttings, keep them in a refrigerator in a plastic bag. Cover the flat with a tent of light clear plastic, supported by two wire hoops; invert a plastic bag over a pot. Place the cuttings outdoors in a location with light shade and protection from the early morning and late afternoon sun. The north side of a house is ideal, or a shaded north-facing cold frame may be used. I have found that cuttings taken during the summer root better in cool temperatures than in warm. Cuttings taken in the fall benefit from bottom heat of 65°-70° F. but do not require it.

Watch the cuttings closely to prevent drying out, for this is the main cause of failure; moisture in the top one-half inch of rooting medium is vital to the life of the cuttings. Sprinkle them lightly whenever the sand on the surface of the medium begins to appear dry. Keep the plastic over the cuttings until they are rooted (about six weeks if they are taken in the summer). Plastic is not necessary if the cuttings are in a cold frame.

Protect the cuttings from freezing in a cold frame the first winter and transplant them from the rooting medium in the spring. I transplant them to 2¾ x 2¾" wooden plant bands containing equal parts of sand, peat or leafmold, and rich soil. They are grown in an open, sunny cold frame, watered daily the first summer, the tips of the new growth being sheared at one inch intervals. The cold frame lid is placed on during freezing weather of the second winter, and the heathers are planted out in the garden the following spring, each in a nest of leaf mold.

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*Member of the Arboretum Foundation Board of Directors from Enumclaw, Washington, especially interested and skilled in growing the heathers and their near relatives.

Witch-hazels of Quality

E. M. Upward*

THE first recorded mention of witch-hazels is in an Act of Henry VIII in 1541—decreeing that "every bowyer—for every bowe that he maketh of Ewe, make fower other bowes . . . of Elme, Wych-hasill, Ashe or other wood."

This Act of Henry VIII could not possibly refer to the witch-hazels we know today—the first of these arrived in this country in 1736—and there seems to be no reference in any work to its meaning or derivation. There is no mention of a definite connexion with witchcraft—the only clue being a reference to the fact "that it is possessed of the power of attracting gold or silver and that twigs of it are made use of to discover where veins of these metals lie hid." That witches had the prerogative of water-divining is not stated, but it is suggested that the name is derived from the similarity of the leaf to hazel and the use of the twigs as divining rods in the early days of the American Colonies.

The Act of 1541 caused confusion because the broadest-leaved elm (as distinct from wych-elm) — *Ulmus folio latissimo scabro* — was known as witch-hazel. Henry VIII's "Wych-hasill" could also refer to hornbeam *(Carpinus),* which was known in various districts as "witch-hazell," "wich-hazle," "wich-hazell," "wych-hazel," and other spellings.

Nowadays, the witch-hazel is known to be *Hamamelis*—a genus of approximately 20 species and their varieties—but the name *Hamamelis* has also been applied to other plants. In *Historia Plantarum* (1587), *(Hamamelis athenaei* is listed with two varieties, *latiorefolio* and *angustifolio:* on inspection of the illustrations, both these plants look suspiciously similar to *Sorbus* species.

Again, the derivation of the name *Hamamelis* is a subject of confusion—some authorities say that it was adopted from a Greek word to indicate the plant's resemblance to an apple tree. Another quotes it as being the ancient Greek name for a pear-shaped fruit, and yet another agrees it is derived from the Greek, but from *hama*—together, and *mela* —fruit, the flowers and fruit being borne at the same time—which is why *H. athenaei* was so named.

The true common witch-hazel as we know it today is *H. virginiana* (its former synonyms being *H. virginica, H. androgyna, H. corylifolia* and *Trilopus virginiana).*

It is not intended to enter deeply into botanical descriptions for the purpose of this article, but the following brief notes are necessary to give the reader an idea of the relative merits and differences between the species, particularly in regard to *H. mollis* and *H. japonica,* where the hybrids between the two have intermediate characters.

A native of North America, *H. virginiana* grows in moist woods and thickets along the banks of streams, east of the Mississippi from Canada to Louisiana. It is a shrub—from 10 to 25 ft. tall and spreading to 12 to 15 ft. Its leaves are smooth and wavy-toothed, being unequal at the base. Showy, scented, bright yellow flowers, borne in profuse axillary clusters, appear in the autumn but are sometimes masked by the fading yellow leaves. Its crooked branches seem to cause some annoyance to the Americans: it is "one of the most difficult shrubs to eradicate from a clearing."

Valuable Medicine

The fruit is a hard woody capsule that matures throughout the summer and contains two black "nuts": these contain the edible seeds, which are ejected forcibly when ripe —giving rise to another common name," snapping hazelnut." In its native land the oily seeds are considered to be a valuable medicine. A fluid extract — well-known in this country — made from the leaves, is used as

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*Mr. Upward is Secretary of the Alpine Garden Society, London, England. This valuable and comprehensive review of the genus *Hamamelis* is reprinted with the generous permission of the author and the Editor of *The Gardeners Chronicle — Gardening Illustrated* (London), from vol. 153, nos. 6, 7 and 8 (Feb. 9, 16 and 23, 1963) in which it was originally published.

a tonic and lotion for rheumatism, bruises, cuts and insect bites. The Indians had also considered the bark to be a cure when applied to painful tumours and external inflammations. "A cataplasm of the inner rind was found to be efficacious in removing painful inflammations of the eyes." Although surpassed by the Chinese and Japanese species described later, *H. virginiana* can well be included in the garden on account of its light yellow autumn foliage, though its main horticultural value lies in its use as a stock for grafting.

Closely allied to *H. virginiana, H. macrophylla* has smaller leaves, with more rounded lobes, roughened by persistent tubercles. The petals are pale yellow with the sepals yellow inside and flowering at the same time as *H. virginiana*. Rehder lists *H. virginiana rubescens,* with red petals and sepals yellowish or brownish-green inside—but no reference can be found elsewhere to this particular plant. Introduced to this country in 1736 by Peter Collinson, *H. virginiana* remained the only known species for over a century—until 1845—when *H. vernalis* was first discovered on the banks of the Upper Meramec River in Missouri, although there is no record of it having reached this country before 1910. This suckering shrub (a good specimen of which can be seen in the Savill Gardens, Windsor Great Park) is up to 15 ft. tall, with light yellow strap-like petals, reddish towards the base, with a pungent and not very agreeable odour; it appears in January and February and does not approach the standard of the Chinese and Japanese species. According to Rehder there are two sub-species—*H. vernalis tomentella,* with similar petals but leaves more densely hirsute, and *H. v. carnea,* with red petals. On examination of material and notes at the Kew Herbarium, however, it is obvious that the latter is not a sub-species of *H. vernalis,* but is probably a hybrid with *H. mollis*. In Holland a new cultivar was raised from seed in 1935 by M. Pierre Lombarts and is well known in Holland as *H. vernalis* 'Lombarts Weeping'—there have been no other seedling variations from this source.

The next witch-hazel to be introduced was a variety of the Japanese witch-hazel, *H. japonica arborea*. This was initially named *H. japonica;* it was not known to be a form until *H. japonica* itself was discovered. The curiously twisted, deep yellow petals have been described as "weird and conspicuous," but it is an extremely attractive tree when in bloom. It was awarded a first class certificate in 1881 when exhibited by J. Veitch; the fact that *H. japonica* has never been given an award is sufficient to indicate that the form far surpasses its parent species. It is generally taller than *H. japonica,* with fewer spreading branches, up to 20 ft. high. It was first introduced from Japan by Von Siebold in 1862. There is some doubt over the date of introduction of *H. japonica,* as it is not even described in Curtis's *Botanical Magazine;* however, Rehder seems to think it was in 1862—probably at the same time as *H. j. arborea*. Its almost scentless flowers are pale lemon-yellow and smaller than *H. j. arborea* but are very welcome in February—occasionally to March; the form 'Superba' has more scent and slightly larger and deeper petals, but with fewer clusters along the branches. The leaves of both these plants are glabrous, with prominent veins. Generally this shrub grows to 10 to 15 ft. and 8 to 10 ft. wide, and is best left unpruned.

The next variety of *H. japonica* to be introduced was *H. j. Zuccariniana*—according to the Dutch in 1868, but Rehder states it was raised in cultivation in 1882. Messrs. Veitch exhibited the plant in 1891, when it was awarded a first class certificate. It is not one of the outstanding varieties of the genus; indeed, if it had been exhibited for the first time in 1962 it is doubtful whether it would have received any award, but its lemon-yellow flowers and greenish calyx extend the witch-hazel season into March. Rehder describes its habit as being similar to *H. j. arborea* but more erect—this does not agree with the specimens in the Savill Gardens which are loose and spreading and branching quite freely, nor with the specimen of *H. j. arborea* at the Royal Horticultural Society's

gardens at Wisley, which is very erect and rarely branched. The leaves are slightly smaller and darker than those of *H. japonica*.

Confusion

About 40 years elapsed before two more *H. japonica* varieties appeared. A definite *japonica* type is *H. j. rubra*, with smallish red petals—the shape and texture of the leaves are *japonica*. Its place and date of origin are not at all clear—the R.H.S. *Dictionary* states 1919, but it was not shown at Vincent Square until 1922. To add to the confusion Bean states that *H. japonica rubra* is synonymous with *H. j. flavo-purpurascens* and adds that it is found wild in several provinces of Japan. This is a statement that is hard to reconcile with a suggestion made by Mr. de Belder of Kalmthout Arboretum, Belgium, that the latter variety is a hybrid. Comparing the leaves of a specimen of Mr. de Belder's *H. j. flavo-purpurascens* with a plant of *H. j. rubra*, there can be seen no resemblance whatever; but Mr. de Belder's plant was also unlike a specimen of *H. j. flavo-purpurascens* from a reputable British nursery. This merely proves how mixed stocks have become in cultivation.

At Wisley there was a plant in the Wild Garden labelled *Hamamelis japonica rubra superba*—but on inspection it proved to be not a *japonica* type—its characters were intermediate between *H. japonica* and *H. mollis* —and on further investigation it was discovered to be the original name applied to the hybrid *H. intermedia* 'Ruby Glow.'

As for the plant known as *H. japonica flavo-purpurascens:* as noted in my first article, there is some controversy about it. Introduced in Japan by Makino in 1919 as *H. incarnata* and then as *H. obtusata* var. *flavo-purpurascens*, it was then confirmed by Rehder as *H. j. flavo-purpurascens* (Mak.), Rehd.

Mr. de Belder, of the Kalmthout Arboretum, Belgium, raised the following points:

"We planted a number of spontaneous seedlings of an original plant of *H. j. flavo-purpurascens* and it is interesting to note that these seedlings varied in the same way as those of the *H. intermedia* selections of Mr. Kort (Mr. Kort was Director of the nurseries whose collections became the Arboretum).

"From this experience we may suppose that these selections of Mr. Kort were most probably seedlings of his plant of *H. j. flavo-purpurascens*—but considering the variation in colour and shape (curled to straight petals) of these seedlings, we may conclude that either the mother plant has been pollinated by another species or the mother plant has been a hybrid itself. In the first alternative we must notice that the following pollen parents were available at the time that Kort got his seedlings: *H. mollis* and *H. j. arborea*. In the second alternative it would be interesting to note the characters of the variety *H. j. flavo-purpurascens* as in my opinion it may be intermediate between *mollis* and *japonica*—in pubescence, shape of leaves, etc."

The most recent *H. japonica* introduction is *H. j.* 'Sulphurea,' which was given an award of merit in 1958 when exhibited by the Crown Estate Commissioners. It was picked out of a batch of seedlings in the nurseries of J. R. Russell Ltd., at Windlesham.

Until the late nineteenth century hamamelis were known to exist in America and Japan (providing one of the many links to the theory of the two countries having been joined together at one time) and in 1879 Maries's discovery of *H. mollis* extended the genus to China. *Hamamelis mollis* has been described as the finest of the species, yet it did not receive a first class certificate until 1918, when exhibited by Messrs. Veitch. This "gem of the family" flowers from Christmas onwards for some weeks, some of its varieties extending the season to February. Its delightfully fragrant, golden-yellow flowers appear in clusters along the base of the previous year's leafless twigs. The colour of the four strap-shaped petals is emphasized by the wine-coloured calyx. A significant fact about *H. mollis* is that when the Royal Horticultural Society introduced the system of giving plants an award of garden merit in 1922, it was the first plant to receive this award. It is a little difficult to describe a typical example of this shrub as there appear to be several different forms. Generally speaking, the true

H. mollis is of fairly upright growth—there is record of a specimen at Lanarth being 16 ft. tall by 12 ft. wide in 1931, which by 1948 had grown to 27 ft. by 18 ft. and is presumably taller today if still in existence. Dr. Henry reintroduced *H. mollis* in 1887 and Wilson collected two more specimens later. Dr. Henry's introduction went to Veitch's nursery at Coombe Wood and could possibly be *H. mollis* 'Coombe Wood Form': this variety has a wider spread with larger and deeper-coloured flowers, appearing at the same time as *H. mollis* itself.

The late Lord Aberconway referred to two forms at Bodnant—one spreading 8 ft. high and 25 ft. across and one upright, 20 ft. by 10 ft.:

"The spreading form flowers a fortnight later and the flowers are of distinctly deeper colour than is the case with the upright form.

"One has always understood that this species was introduced by Maries and remained unidentified at Veitch's nursery. If so Maries either sent two forms or one of the forms must have originated in a different sending—possibly by E. H. Wilson. Wilson certainly collected specimens of *H. mollis* but I cannot find it stated that he actually sent home seed."

The upright form was exhibited by the present Lord Aberconway and the National Trust in February, 1961, when it received an award of merit under the name of 'Goldcrest.' It was stated at the time that 'Goldcrest' was raised from seed sent home by Wilson, which was possible as Wilson sent seed to the Arnold Arboretum.

Although *H. mollis brevipetala* was exhibited in 1950 and again in 1955, it was not until it was presented once more in 1960 that it received an award of merit. This variety bears buttercup-yellow flowers with rather crimped narrow petals about ½ in. long which are blunted and notched at the ends. The flowers are sweetly scented. As with many of the forms of *H. mollis,* the origin of *H. m. 'brevipetala'* is obscure. It is quite an old form, as Moerheim Nurseries first obtained it from the Chenault Nurseries, who in turn received it from the Grandes Roseraies du Val-de-Loire, the latter having introduced it from the Arnold Arboretum in the 1930s.

Hamamelis mollis 'Pallida' was first exhibited in 1932, when it received an award of merit, and in 1958, when it received a first class certificate. Its pale lemon flowers are larger than those of *H. mollis* and the shrub as a whole is more erect and perhaps of more rapid growth. As the original plant was exhibited by the Wisley Gardens, some authorities have assumed that the plant originated there, but it is reputed to have been found in a derelict Dutch garden—scions having been taken and distributed in this country. There is some doubt about the latter suggestion as no record of *H. m.* 'Pallida' appears in Continental literature.

This completes as brief a description as possible of the well-known species and their varieties. Although there are more listed in *Index Kewensis* and other books, failing any further intensive searching, they are probably synonyms or of poor quality and certainly not in cultivation in this country. An account of the modern hybrids follows in the next, and final, article.

* * *

Now follow details of the modern hybrid introductions, many of which are still incorrectly classified in nurserymen's catalogues as being varieties of either *H. mollis* or *H. japonica.*

In 1945 the introduction of *H. intermedia* (Rehd.) was announced from the Arnold Arboretum:

"The hybrid was first raised in 1939 from seed collected the previous year from plants of *H. mollis* received from Veitch, raised from seed sent to Veitch by Maries, and from a plant of the same species raised from seed collected by Wilson in 1907, and sent to the Arnold Arboretum.

"None of the seedlings were true *H. mollis* —they were intermediate between *H. mollis* and *H. japonica*—of which several varieties were growing in the Arboretum. *H. intermedia*

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New or Unusual Plants in the Arboretum

XII—*Pachystegia insignis*

J. A. Witt

SHRUBBY members of the composite (daisy) family are not very common in the Arboretum's collections and plants native to New Zealand are only moderately well represented, so that a shrub daisy from those southern hemisphere islands is a plant worthy of note. Actually there are several genera of New Zealand shrubby composites growing in various places in the Arboretum. These include *Olearia, Cassinia, Celmisia, Senecio,* and the monotypic genus *Pachystegia.*

Pachystegia insignis is a low, spreading shrub, seldom over six feet tall, that is found growing from sea level to about 4,000 feet elevation on the South Island. We received seed of it from the Botanic Garden, Christchurch, New Zealand, in 1954. Eight seedlings were planted at the west end of the greenhouse in a well drained bed in June, 1957, where they gradually dwindled in number, probably due to cold winter weather. Two plants first flowered in July, 1961, and the one remaining is well budded this spring although the foliage shows signs of the winter's cold. It is now a woody-stemmed, somewhat sprawling, sub-shrub, about a foot tall and a foot and a half across. Its foliage makes it a true thing of beauty. The leaves are persistent, leathery in texture, the largest about five to six inches long and three across, obovate to elliptic with a round apex. The upper surface is a pleasing grayish green and is outlined with a silvery gray margin. The under side is covered with tawny-gray felt, pleasantly soft to the touch. In the spring the new growth is covered by a silvery down that contrasts beautifully with the shining green of the unfolding leaves. *Pachystegia insignis* is so charming as a foliage plant that the flowers are somewhat anti-climactic. The aster-like flower heads are borne singly on

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Rhododendrons for the Rock Garden

TED AND MARY GREIG

INTRODUCTION

In January 1963 the Education Committee of the Arboretum Foundation arranged a series of three illustrated lectures by well-known, highly experienced growers from the Pacific Northwest, on the general subject of Shrubs for the Rock Garden.

The first of the series was given by Mr. E. J. Greig, of Royston, Vancouver Island, B.C., January 9, at the Arboretum Clubhouse, on Rhododendrons for the Rock Garden. Because of Mr. and Mrs. Greig's long experience with these plants, we have borrowed the notes used in his talk and have now utilized the majority for publication in the Bulletin, *since they contain so much first-hand experience of the behaviour of these plants in a climate which is distinctly less favorable than that of Seattle, as the following notes indicate.*

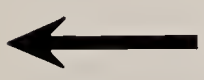
Average annual rainfall at Royston; approximately 60 inches.

First frost; usually mid-October.

Last frost; variable, from mid-April to mid-May.

Months of heaviest rainfall are normally November-December, sometimes January, although if weather is cold precipitation would in that month be in the form of snow. June is normally a wet month, occasionally extending into July. There has been a noticeable warming trend in our climatic conditions in recent years; this factor is not constant, but when we first started gardening here over 40 years ago there was seldom a winter without at least one sub-zero spell; this usually during the early part of January, followed, or occasionally being preceded, by a heavy fall of snow, sometimes as much as four feet. The last really heavy fall of snow here was in 1947-48. Since then it has never exceeded 20 to 24 inches at any one time, usually less.

A modifying factor here on the east coast of Vancouver Island—away from Victoria, where other factors come into the picture—is our nearness to the mountain range which forms the backbone of the island. This acts as a refrigerator close by. This range is of course well covered with a heavy blanket of snow from Oct./Nov. until June or even late July. In clear winter weather this cold air is spilled out over the east coast. In summer this works to our advantage, luckily, in giving us cool and reasonably humid conditions, even though we do of course get dry and hot spells when travel in the woods is forbidden.



Pachystegia insignis flowering in the Arboretum at end of June 1961.

FIG. 8 PHOTO BY: J. A. WITT

Before discussing rhododendrons and their place in the rock garden, I think a few preliminary remarks of a general nature might be in order, for the benefit of any of my hearers who may have recently become afflicted with Rhododendronitis.

There is no lack of information on the genus; there is a steady flow of literature on most aspects of the subject, which continues unabated.

We are particularly fortunate here in the Pacific Northwest in having soil and climatic conditions suitable for growing so many of these beautiful plants. Occasionally Nature will deal us a foul blow, as many of us will remember, but with the majority of the plants we will be discussing this evening, even the elements will usually leave us unscathed.

The huge genus of *Rhododendron*—some 800 species—has, with the exception of the *Azalea* section, and disregarding the Malayan species, been divided into two main groups: Lepidote (scaly) and Elepidote (non-scaly). As an aid to classification, the genus is at present set up in forty-three series, many of these series being again divided into subseries. Of these forty-three series, roughly half are Lepidote, and the remainder Elepidote. Now it is rather strange, but with a few notable exceptions, the majority of the dwarfer types suitable for the rock garden belong to the Lepidote group.

The dwarf moorland types from high altitudes in the far eastern mountains are invariably gregarious, and this we should bear in mind in adapting them into our scheme of things in the rock garden. In this regard I have in mind perhaps more particularly species of the *Lapponicum, Saluenense* and *Glaucophyllum* series.

I have said that, generally speaking, we have normally no problem as to soil. Good drainage is, of course, essential, and the ideal would be a north-facing slope with shade during the latter part of the day. Some species will stand far more sun and drier conditions than others; one I have in mind is *R. racemosum,* of which there are several forms. If shade is required for some particular plant, and the layout of the ground will not allow of this naturally, it could be achieved by a strategically placed rock or two, or a bush of a taller form to give such desired shade.

*Notes on Selected Species**

*Including meaning of specific name, series to which assigned, and country of origin.

Rhodn. aperantum (limitless)—*Sanguineum* series—Burma. Very slow and very difficult. Ours is red.

R. apodectum (acceptable)—*Sanguineum* series—W. Yunnan. Spreading and slow-growing. Orange flushed rose.

R. atlanticum (from Atlantic Seaboard)—*Azalea* series—E. U.S.A. Very sweet-scented, sometimes but not always stoloniferous. Whitish, May. Up to 3 ft.

R. auritum (with long ears)—*Boothii*—Tibet, Bhutan. Dark green foliage, pale yellow flowers in April. Not as good as *R. xanthostephanum* but possibly a little hardier.

R. Baileyi (after Lt. Col. Bailey, a Tibetan traveller)—*Lepidotum*—S. Tibet. Rather straggly in habit, but a superb brilliant red-purple in the best forms. May. 2-3 ft.

R. brachyanthum (with short flowers)—*Glaucophyllum*—Yunnan. *R. hypolepidotum* and *R. charitostreptum* now included in this species. Flowers soft yellow, very pretty but not conspicuous.

R. caesium (dullish blue)—*Triflorum*—Yunnan. Name probably refers to the greyish, copper-tinged leaves. A tidy, twiggy bushlet, yellow flowered. Worth room as a foliage plant.

R. calostrotum (with a beautiful covering)—*Saluenense*—Burma. Flowers purple, like most of this series. Leaves greyish or reddish, densely covered above and below with scales. Very good.

R. campylocarpum (with bent fruits)—*Thomsonii*—Nepal and Sikkim. This is Hooker's form, the only form to remain small enough for a rock garden. We have a plant in its twenties that is not more than 2 ft. tall, pure bright yellow. Almost impossible to propagate vegetatively, except by grafting. We have a number of selfed seedlings about which we are hopeful. However, it is some years before a seedling flowers and none of ours have yet done so.

R. campylogynum (with bent ovary)—*Campylogynum*—S. Tibet. Our form is very dark, though lovely when seen with light shining through. Strong box-like scent to the leaves.

R. campylogynum var. *myrtilloides*—soft pinkish lavender.

R. campylogynum 'U. B. C.'—This may vary from rose pink to near black.

R. canadense (from Canada)—*Azalea*—N.E. N. America. Odd, very split corolla, giving a butterfly-like effect on the bare branchlets. Very twiggy. Likes moist situation.

R. chaetomallum (with fleecy hair)—*Neriiflorum*—S.E. Tibet and N.W. Yunnan. Close habit, handsome leaves, with thick, tawny indumentum on best forms.

R. chamae-Thomsonii (dwarf Thomsonii)—*Neriiflorum*—S.E. Tibet. Similar to *R. repens,* but up to 2-3 ft. Rich red flowers in April.

R. chamae-Thomsonii var. *chamaethauma* (formerly *R. chamaedoron*). Smaller-leaved than type. Brilliant clear pink.

R. chamaeunum (lying on the ground)—*Saluenense*—Yunnan. Magenta flowers in May-June, one of the latest. Bright, shining leaf.

R. chamaeunum var *cosmetum*. Similar to others of this series; in old plants a good Bonsai-type treelet. 6-8 inches high.

R. Chapmanii (after A. W. Chapman, American botanist) — *Carolinianum* — Florida. Very attractive, flowers young, good pink. Heat resistant.

R. charitopes (graceful of aspect)—*Glaucophyllum* — Upper Burma. Crimson-speckled pink flowers. Good bushy habit.

R. chryseum (golden yellow) — *Lapponicum* — Yunnan, Mekong-Salween Divide. 1½-2 ft., bushy, pale yellow flowers.

R. chrysodoron (golden gift) — *Boothii* — S.W. China. This has survived for several years under a plastic light and might be hardy in Seattle. It is a lovely golden yellow.

R. ciliatum (fringed)—*Maddenii*—Sikkim. The foliage is fringed with hairs. Flowers pink in bud, opening to white. Hardy here.

R. comisteum (to be taken care of)—*Taliense*—S.E. Tibet, Mekong-Salween Divide. The leaf is typical of *Roxieanum* sub-series, in miniature, and so is the plant. We have not flowered it but if it never flowered it is worth a special place.

R. concatenans (linking together)—*Cinnabarinum*—Tibet. There is a low, spreading form of this lovely foliage plant, though 1955 wiped out our old plant and all our stock. The flowers are pale yellow, rather inconspicuous, but the waxy, blue-grey foliage is very beautiful.

R. cuneatum (wedge-shaped) — *Lapponicum* — Yunnan. Too tall for anywhere in the rockery but at the back. A good form is very showy. Much larger-leaved and -flowered than most of the Lapponicums.

R. dauricum var. *sempervirens* — *Dauricum* — N. Central and N.E. Asia, and Japan. The type is deciduous and much taller than this charming little bush. Flowers magenta, in Jan.-Feb.

R. Degronianum (after M. Degron)—*Ponticum*—Japan. Not so fashionable as *R. yakusimanum* but as much a treasure. The leaf perhaps not quite so handsome as the latter in its very best form.

R. dichroanthum (two-colored flowers)—*Neriiflorum*, sub-series *Sanguineum*—Yunnan. Kingdon-Ward said very unkind things about this sometimes exquisite species. It does vary greatly but is at its best orange or a curious rosy-orange. A rogue in Rock No. 50 which seems more nearly *dichroanthum* than anything else but is a fine orange-red and larger in leaf and flower than most forms. (Mr. Greig's slide was of the Sunningdale form.)

R. didymum (two-fold)—*Neriiflorum*, sub-series *Sanguineum* — S.E. Tibet, Salween-Kiuchiang Divide. Very late flowering, and so dark in its red that it should be planted above the viewer, so that the sun may light it from behind.

R. Edgarianum (for Rev. J. H. Edgar, China Inland Mission) — *Lapponicum* — W. Szechuan. The best form is a rich blue-purple, which we have lost. It is the last of the *Lapponicums* to flower, May-June.

R. euchaites (with beautiful hairs)—*Neriiflorum* —Shweli-Salween Divide. This does get too big for the rock garden but could be enjoyed for a year or so. It is a brilliant scarlet.

R. fastigiatum (erect) —*Lapponicum*—Yunnan. Though the name means "erect" the forms usually seen are quite the reverse. We wonder if there is any real difference between *fastigiatum* and *impeditum*, or if the latter has been masquerading under the name *fastigiatum*. We have never seen a really erect form. The color varies from a rich blue-purple to magenta.

R. ferrugineum (rusty-colored)—*Ferrugineum*—S.E. Europe. The name refers to the scales. The head of small flowers is a bright cherry pink, June.

R. flavidum (somewhat yellow)—*Lapponicum*—W. China, E. Tibet. The old name was *R. primulinum*. This is the best yellow *Lapponicum* generally seen. Dr. Rock collected a fine yellow under his A.R.S. No. 7 but this seems to be neither *chryseum* nor *flavidum*. The flowers of *flavidum* are much larger than most of the Lapponicums and it can become quite tall, so should be planted towards the back of the rock garden.

R. Forrestii var. *repens* (after George Forrest, collector; varietal name describes its creeping habit)—*Neriiflorum*, sub-series *Forrestii*—China and Tibet. There are a great number of forms, all similar in their large, bright red corollas, and in having only one or two flowers in pairs —or, very occasionally, three. Some forms are much smaller leaved than others, some more prostrate, and some shyer flowering than others. The form *chamaedoxa* (called by Kingdon-Ward, when he found it, "scarlet runner") is rather less prostrate and quite free flowering. *Chamaedoxa* means "dwarf or ground-hugging glory."

R. glaucophyllum (with bluish-grey leaf) — *Glaucophyllum*—Sikkim. The name refers to the almost white underside of the leaf. The dangling bells vary from magenta to delightful pinks.

R. glaucophyllum var. *luteiflorum* (yellow flowered) (K.W. 21048)—N. Burma. Exactly similar in leaf but has pretty primrose bells.

R. haemaleum (blood-red) — *Neriiflorum* — Salween-Mekong Divide. A dark crimson, flowering in late May or June. Like *R. didymum* in needing to be lighted from behind, though it is not as dark as *didymum*.

R. haematodes (blood-like)—*Neriiflorum*—Yunnan. Brilliant red flowers in May. The leaves are felted with a heavy red indumentum. It is a marvelous plant.

R. Hanceanum var. *nanum* (for H. F. Hance, British Consul at Canton) — *Triflorum*, sub-series *Hanceanum*—W. Szechuan. Makes a tidy, close, little bush and is very free-flowering. There is said to be a white form but we have seen only the usual pale cream, occasionally with reddish calyx and anthers.

R. herpesticum (spreading)—*Neriiflorum*, sub-series *Sanguineum* — Yunnan. The yellowish flowers are dullish in tone but the flat-topped, dense bush of heavily-veined, glossy, dark-green leaves is very handsome.

R. hippophaeoides (resembling sea-buckthorn) —*Lapponicum*—Yunnan. In its better forms, this is one of the best of the Lapponicums, though it grows quite fast and has a rather loose habit. It should probably be planted well back and given a fair amount of room.

R. hirsutum (hairy)—*Ferrugineum*—S. Cent. Europe, on limestone. Except for the conspicuous hairs on the leaves and a rather tidier habit, this is similar to *R. ferrugineum*. There is a very good, pure white form.

R. horaeum (beautiful)—*Neriiflorum*, sub-series *Sanguineum* — S.E. Tibet, Tsarong, Salween-Kiu-chiang Divide. Similar in habit to *R. herpesticum* and *R. scyphocalyx*, though it has red flowers and a felted indumentum on the underside of the leaves.

R. impeditum (tangled)—*Lapponicum*—Yunnan. This is a perfect, small bush, always covered with its mauve or blue-purple flowers in April, and, as with many of the Lapponicums, again in August or September. The tiny, blue-grey leaves make this a very attractive plant when out of flower. Here, it is most essential to remove withering flowers and seed-heads or the bushlets are unsightly, as well as wasting their effort on growing a great quantity of unwanted seed.

R. indicum (Indian) var. *balsaminaeflorum* (Impatiens-like flower) — *Azalea* — Japan. A lovely little prostrate azalea, with double pink flowers like small rosebuds. *Azalea rosaeflora* of the trade.

R. intricatum (entangled) — *Lapponicum* — W. Szechuan. A tallish *Lapponicum*, nearly always a good lavender-blue.

R. Keiskei (after Ito Keisuke, Japanese botanist) — *Triflorum* — Japan. A very dwarf and twiggy little bush, with cream flowers, or perhaps a little yellower than cream. It is always covered with flowers in April-May.

R. keleticum (charming) — *Saluenense* — Tibet. Close to *R. radicans*. Does not care for full sun.

R. Kotschyi (after Theodore Kotschy, Austrian botanist)—*Ferrugineum*—C. Europe. Very similar to *R. ferrugineum*. A very delicate pink form exists, which is delightful.

R. lepidostylum (with scaly style)—*Trichocladum*—W. Yunnan. A lovely, hairy, grey-leaved dwarf. It makes a solid spreading hummock. The grey is much better if grown in a fair amount of shade. Yellow-flowered, but it carries the flowers among the leaves and they are rather lost. Worth having if it never flowered.

R. leucaspis (white shield)—*Boothii*—Tsangpo Gorge, Tibet. Flowers in Feb.-March. Not quite hardy here.

R. Ludlowii (F. Ludlow, collector in eastern Himalaya) — *Lepidotum* — S.E. Tibet. Flowers when still very tiny and the flowers appear enormous. Yellow.

R. Makinoi (after T. Makino, Japanese botanist) —*Ponticum*—Japan. Eventually much too big for the rock garden, but the handsome whorls of almost linear leaves make it a striking plant and it grows slowly. Trusses of delicate pink in June.

R. Martinianum (after John Martin, Cornish gardener)—*Thomsonii*—S.E. Tibet, N.W. Yunnan. A slow-growing, pleasant little bush, with pale rose or creamy-white flowers in April-May. Very pretty leaf.

R. microleucum (small and white)—*Lapponicum* —originally described from a Forrest seedling in Exbury rock garden. A good dead white. Some forms seem to be freer-flowering than others.

R. moupinense (from Moupin, W. China)—*Moupinense*—W. China. Handsome shiny leaves and, as far as we know it, milk-white flowers, in Feb.-March.

R. mucronatum (pointed) — *Azalea,* sub-series *Obtusum*—long cultivated in Japan and China. Frequently called, "*Azalea ledifolia.*" Our oldest plant has been with us for many years and shows no intention of reaching 6 ft., as the handbook suggests. It is a dense and spreading bush, of 18 inches or so, and in flower covers its leaves completely. There are various good forms, 'Noordtianum' being a very lovely one that is larger in flower than the type, but not as hardy here. Both are a sparkling white and bloom in May.

R. mucronulatum (with a small point)—*Dauricum*—Korea and Japan. Deciduous, flowering in Jan.-Feb. A lovely sight, if a place can be found where it can be protected from frost while in bloom. Quite hardy otherwise.

R. obtusum (blunt)—*Azalea*—Japan. One of the parents of the many well-known Japanese azaleas. The flowers are puce, the bush is shapely and very slow-growing. It flowers in May and at a very small size.

R. orbiculare (round)—*Fortunei*—W. Szechuan. The almost round leaf makes the plant very noticeable. The rather elongated truss is a bright rose-pink, and the bush itself is shapely. It would eventually become too large for most rockeries, but it grows slowly.

R. pemakoense (from Pemako, S.E. Tibet)—*Uniflorum*—Tibet. Up to 1 ft., very floriferous. We know two forms—one with larger flowers of very pale pinkish-purple, the other is rather smaller in leaf and flower but a deeper and better color.

R. pentaphyllum (five leaved)—*Azalea*—Cent. and S. Japan. Very beautiful in flower and leaf. Grows slowly and flowers before leaves appear. The one- or two-flowered inflorescence is very pale pink and the whole effect is fragile and lovely.

R. primulaeflorum (primrose-flowered)—*Anthopogon*—S. Tibet. The botanist who chose that name had a vivid imagination, but it is interesting for its highly aromatic leaves. A background plant, as it is fairly tall.

R. prostratum (low-growing)—*Saluenense*—Yunnan. Very prostrate, slow-growing, and rather pernickety. Not too much sun.

R. pubescens (downy)—*Scabrifolium*—S.W. Szechuan. The small flowers, carried in the axils towards the end of the arching shoots, are pale pink, with a deeper rim, very attractive. It is a simple matter to keep it within bounds by a judicious use of the secateurs.

R. pumilum (dwarfish)—*Uniflorum*—Sikkim, Tibet, and Burma-Yunnan border. Not too easy to please, however, with us. Flowers in May-June.

R. quinquefolium (leaves in fives)—*Azalea*—Japan. This is very slow-growing, though the lovely leaf makes even four-five inch plants a joy. We have not yet flowered it, but it is white, up to 12 ft. in height. Not in our lifetime, I would guess.

R. racemosum (flowers in racemes)—*Virgatum*—Yunnan. Some forms are less dwarf than others, some larger flowered, and some a deeper pink, but all are good. Full sun.

R. radicans (rooting)—*Saluenense*—S.E. Tibet. Rooting? It doesn't, but no matter! The most prostrate form is very tiny leaved and hugs the ground tightly. However, cuttings can decide to go up a bit, and some forms are almost interchangeable with *R. keleticum.* It will not tolerate full sun, but needs plenty of light to keep it down.

R. ravum (grey)—*Lapponicum*—Yunnan. One of the much larger Lapponicums, in habit, leaf, and flower. Flowers magenta. The leaf is very dark green, almost bronze.

R. recurvoides (resembling *R. recurvum*)—*Taliense,* sub-series *Roxieanum.* Though eventually, in a long life, it might become too large for a rock garden, for many years this would be a proper place for it, in considerable shade. Most of the *Roxieanum* sub-series would be equally happy in the same circumstances. When they become old and gnarled, they have a decidedly Japanese appearance, or maybe it is Chinese, which is not unreasonable, as they are confined to Yunnan.

R. riparium (growing on river banks)—*Saluenense*—Tibet. Now merged with *R. calostrotum,* this species is, from the garden point of view, quite different in leaf and habit. In the best form it is a sparkling magenta, but the duller forms are not very good. Like *R. calostrotum,* it is less winter-hardy than most of the *Saluenense* series.

R. russatum (reddened) — *Saluenense* — N.W. Yunnan. Half-way between the larger species *R. cuneatum* and *R. ravum* and the small Lapponicums, this is one of the very best. Flowers purple. It likes full sun and even manages to ignore the sea breezes and early morning sun. The oldest plant in our garden is now almost five feet tall and three or four in diameter.

R. saluenense (from the Salween river)—*Saluenense*—W. China. Outstandingly aromatic, in a generally aromatic series. Larger flowered than most of the others, and generally a bigger plant. Some of Rock's No. 152 are remarkably good.

R. saluenense—A. M. form. By contrast with the type, a very dwarf plant and the color much deeper red-purple, though the flowers are smaller. It is also much later in flower. In fact, it is much more like a very fine form of *R. chamaeunum.*

(Continued on Page 61)

Winter Damage at the Morris Arboretum

John M. Fogg, Jr.*

THE winter of 1962-63 must go into the annals as one of the most severe in the history of the Philadelphia area. Although we made a similar pronouncement in the spring of 1961 and again last spring, the severity of the recent winter exceeded that of its two predecessors. This was due largely to three factors: persistent low temperatures, high wind velocities, and lack of precipitation.

November was the coldest since 1901 and the winds were the highest since 1959. There was a slight excess of precipitation, but no snowfall. December was marked by abnormally low temperatures, high winds, and very scanty precipitation, only nine inches of it in the form of snow.

January witnessed deficiencies in precipitation (about one inch) and temperature (nearly five degrees). Again, there was very little snow (about six inches). February was likewise deficient in rainfall and temperature units (nearly seven degrees) with extremely high winds and very light snow cover.

March was what might be called a "normal month," until its closing days when record-breaking high temperatures occurred over a four-day period. Again, very little rainfall.

Probably the most significant of all of these factors has been the lack of precipitation with the resulting absence of any continuous snow cover. The total snowfall for the winter has been only 20.5 inches, compared to 28.8 in 1961-62 and 49.1 in 1960-61. In short, we are in the vise-like grip of a drought which dates back to August, 1961. From January 1 to April 30, 1963, this area has been over four inches deficient in precipitation.

The joint effects of low rainfall and lack of appreciable snow cover are reflected in the damage sustained by the woody plants in the Arboretum. While it is still too soon fully to assess the extent of this injury, it seems desirable to record a few of its obvious effects before they become obscured by other factors.

*Director of this well-known Arboretum, which has been controlled by the University of Pennsylvania since 1932.

Conifers

Most of the members of the pine family survived the winter far more satisfactorily than was the case in the two preceding seasons. It is true that we lost about a score of recently planted eastern white pines *(Pinus Strobus)* and that our more temperamental plants, such as *Cryptomeria japonica* and *Cunninghamia lanceolata,* experienced even more "winter burn" than usually occurs. But when such marginal species as *Pinus palustris* and *Cedrus Deodara* come through apparently unscathed, one is tempted to conclude that most representatives of the *Pinaceae* are better adapted to survive under conditions of low rainfall than are many of the angiosperms.

The same, however, can not be said of the taxads. We have lost numerous specimens of Irish yew *(Taxus baccata)* and Japanese yew *(T. cuspidata)* and even some of our plum yews *(Cephalotaxus spp.)* appear to be in very precarious condition.

Broad-Leaved Evergreens

It was among the members of this group that our most severe damage occurred. Many have been killed completely; others are badly damaged but may eventually make new growth. In all cases patience must be exercised in hope that some regeneration may take place.

Certain species, such as *Cleyera japonica, Arbutus Unedo* and *Symplocos tinctoria,* are admittedly tender in the Philadelphia area and their demise was not surprising. Others, such as the evergreen barberries, e.g. *Berberis Julianae* and *B. verruculosa,* have survived most winters in fairly good condition, but this year were severely damaged. Another group which suffered badly were the evergreen cherries, *Prunus caroliniana, P. Laurocerasus* and *P. lusitanica.* The same is true of the evergreen privets *(Ligustrum lucidum* and *L. japonicum),* as well as *Lonicera nitida* and *L. pileata.*

Aucuba japonica and *Mahonia Bealii* were among the other broad-leaved evergreens seriously affected, and throughout the entire area there appears to have been wholesale destruction of the valuable ground-cover, *Sarcococca Hookeriana.*

Other evergreen forms which have been seriously injured if not killed are *Stranvaesia Davidiana, Pyracantha coccinea, Photinia serrulata, Elaeagnus pungens* and *Daphne odora.*

The hollies have suffered less than many other groups, but a few plants of *Ilex Aquifolium* have lost most of their leaves and are slow to make new growth.

Deciduous Plants

Although less seriously affected than the broad-leaved evergreen, many groups of deciduous plants succumbed during the recent winter.

Our greatest loss was among the roses and this is the case not only at the Arboretum but applies widely throughout the area. One large rose nursery is able to fill only a small fraction of its orders and others report that their losses will run into many thousands of dollars.

Another group in which wholesale havoc was wreaked was the azaleas. With us this was particularly true of native species which might be expected to be somewhat more hardy. We have suffered severe loss in such species as *Rhododendron arborescens, R. calendulaceum, R. canescens* and *R. serrulatum.* Strangely enough, *R. prunifolium,* a native of Georgia and Alabama, came through apparently unscathed.

Mature specimens of the Jujube *(Zizyphus jujuba)* and the Franklin tree *(Franklinia alatamaha)* have been killed outright. Others, such as the hardy orange *(Poncirus trifoliata),* crape myrtle *(Lagerstroemia indica),* Chinese fringe-tree *(Loropetalum chinense)* and *Daphne Mezereum* have been so mutilated that their recovery is highly problematical.

Noteworthy Survivals

As is usually the case following any unusual season, certain paradoxes have emerged. A number of plants which are at or near the northern limits of hardiness have managed to survive and seem to be in excellent condition. This includes Alexandrian Laurel *(Danae racemosa)* the purple anise *(Illicium floridanum), Pistacia chinensis, Adina rubella,* and *Koelreuteria formosana.*

One of the most remarkable of all is the survival of two plants of *Elliottia racemosa,* a rare species from South Carolina and Georgia which is usually regarded as not being hardy in the Philadelphia area.

Winter Damage at Callaway Gardens

FRED C. GALLE,* BENJAMIN H. PACE and CHARLES M. BRUSE

THE winter of 1962-63 will be long remembered by plantsmen throughout the South as one of the most drastic winters on record. We have often commented that the problem with many plants in our area was due to fluctuating winter temperatures and this winter brought this out more forcefully than any of the preceding years. We made a resume of some of the variable winter conditions in order to understand some of the problems.

The fall of 1962 was very dry and watering was necessary in order to keep the plants from drying out. The first cold snap was on the 26th and 27th of October, with temperatures down to 20 degrees F. The previous two days had been in the thirties, but, prior to that time, temperatures had been in the seventies and eighties, with lows of forty to forty-five degrees. We noted, after this first drop, that there was extensive damage on many of the azaleas, with some bark cracking, and all of the large display of outdoor chrysanthemums was completely killed.

In December, temperatures started in the sixties and seventies, with lows in the thirties, followed by a gradual cooling trend around the eleventh of December, with a high of

*Director of Horticulture at these privately endowed gardens, located 85 miles southeast of Atlanta, Georgia.

forty degrees and a low of eight degrees. On the 12th we had a low of twenty-two degrees and on the 13th, minus five degrees. This brought serious damage to any plants that were in active growth. Many *Camellia Sasanqua,* and others were extremely damaged. The flower buds on Indian azaleas and some others were lost at this time.

Following this cold, there was an extreme warm-up. On the 18th, the temperature reached a high of seventy-four degrees, the lows being from thirty down to twenty-five degrees. During the week of Christmas, we had three inches of rain. Many of the plants again became active. *Camellia japonica* plants which did not have flower bud damage during the first cold snap began to show color and we were elated to think that perhaps not all of the plants were completely injured. The warming trend continued and, on the 12th of January, we had another rain with high temperature of seventy-eight degrees. For the next week, it was slightly cooler than this, with a high of sixty-eight degrees on the 23rd of January, and then, on the morning of January 24th, there was a low of minus four degrees, a drop of 72 degrees in one night. Following each of these two extreme cold periods, there was a rapid warm-up. The sun was very bright, with excessive winds, so that we had both wind and sun damage on plants. The late January freeze finished off all the *Camellia japonica* flowers and many plants of this type were killed to the ground, while other varieties had only severe foliage damage and damage to one- and two-year-old wood. Many young grafted plants (made the past season) were completely killed.

In Mobile, Ala. and in other areas, it was noted, after the first cold spell in December, that *Camellia japonica and C. Sasanqua* varieties that had been watered during the fall showed less foliage damage than plants not watered. Commercial nurseries had considerable damage to canned plant material. It was also noted that more damage occurred in canned material that was plunged in or set on sawdust, shavings, or plastic, than canned material set on bare ground.

It is interesting to note that many of the native plants in this area showed damage, including *Rhus copallina,* Shining Sumac, *Callicarpa americana,* and others. Cambium injury was observed and the plants are coming out very slowly this spring. Depending on location and exposure, many plants, including *indica* azaleas and wax myrtle *(Myrica cerifera),* looked as if they had been scalded and had considerable foliage damage.

Several azaleas, including 'Red Wing,' 'Albert and Elizabeth,' and 'Triomphe,' often reported to be tender, had no flower damage while *indica* varieties in the same general area had 75% to 100% bud damage. Many of the Satsuki and Chugai azaleas had moderate to severe bud damage. Pericat and *macrantha* azaleas had only slight bud damage, while Kurume, *Kaempferi* and Glenn Dale types had little or no damage to buds.

A resume of plant damage, noted throughout the winter and closely observed this spring, follows. We might also mention that we feel that the effects of this damage, in some cases, will not be noted until late summer. However, this will depend largely on the type of growing conditions that we have throughout the summer season. On the type or degree of damage noted, "slight" refers only to young growth or foliage damage, "medium" damage was on foliage and two- to three-year-old wood, and "severe" damage indicated that plants had bark and trunk damage to the ground level. In some cases, plants will be recorded as having all three degrees of damage, due to observing plants in various locations. It would be impossible to list all plants on this report, but, in some cases, species are reported with no damage to compare with other species of the same genus having damage.

From the very extensive lists of plants damaged in varying degrees, submitted by Mr. Galle and his co-authors, we have selected the following as being of particular interest in the Puget Sound region, regretting that exigencies of space prevent us from publishing the whole.

(Continued on Page 60)

A Simplified Method for Rooting Camellia Cuttings

RICHARD C. FRENCH*

VERSATILE sphagnum moss, *Sphagnum macrophyllum* (longleaf) and *Sphagnum papillosum* (warty), may have still another useful application in the horticultural field. Sphagnum moss has been used for years as a backing in floral displays, as packing material, as mulch, incorporated into potting mixtures, and as a medium for germinating seeds. I have found live green sphagnum to be a useful medium for the rooting of camellia cuttings.

Sphagnum has been used previously in rooting media. Mahlstede and Haber[1] state that sphagnum has been used in mixtures with sand and peat for rooting cuttings. According to these authors this use has not been extensive nor have results warranted widespread acceptance. In the present instance sphagnum is enclosed in plastic films (polyethylene) to provide an environment favorable for rooting.

The live green sphagnum was obtained from a southern New Jersey swamp or bog. The material selected was freed of stray insects, sundews, or other plants or debris which would have a tendency to decay or support bacterial or fungal growth. Only the active chlorophyll-containing portions of the plants were used. The live moss was placed in a polyethylene bag free of holes to prevent loss of water or water vapor.

The camellia cuttings contained two to eight leaves. Most of the cuttings have been sasanquas, although several japonicas have been tried with success. The stems were cut below a node and split vertically one-half to one-fourth inch from the base to supply a greater area of exposed tissue to hormone treatment. The ends of the cuttings were dipped in Rootone[2] powder and inserted in dripping wet sphagnum, then tied up in thin plastic bags. The bags should be placed in diffuse bright light where daily temperature variations are great enough to cause condensation of water on the plastic. The transfer of the condensed water to the leaves of the cuttings may play an important role in the success of this method. Such bags have been placed on a window ledge in an unheated garage during early May, in the kitchen on a north window ledge during summer, or in a south window during winter with considerable success. Placing the bags in direct sunlight must be avoided since most plastic films transmit infrared or heat rays, allowing heat to accumulate to the extent where both sphagnum and cuttings are burned.

Some sasanquas started on July 5 had formed callus and small roots by August 21. Other cuttings of *sasanqua* and *japonica* rooted by September 2. Cuttings started later in the year or during winter months required longer periods of time to root.

The use of live sphagnum provides a continuous supply of natural fungicide or bactericide which seems to prevent rotting or moulding of the cuttings. This fungicidal activity is in addition to that of the chemical fungicide included in the formula of the root stimulating hormone preparation. Mahlstede and Huber[1] state that fungi associated with sphagnum produce substances which prevent the development of fungal complexes causing damping off. They state further that stored, old, or sterilized sphagnum gives little control of damping off. This is further evidence

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*Plant Physiologist, Agricultural Marketing Service, U.S.D.A., Plant Industry Station, Beltsville, Maryland. Reprinted by kind permission of the author and of the Editor, Mr. Joseph H. Pyron, from the *American Camellia Year Book*, 1962-63.

[1]Mahlstede, J. P. and E. S. Haber. Plant Propagation. John Wiley and Sons, Inc. New York. 1957.

[2]Rootone is a proprietary preparation containing 0.067% naphthylacetamide, 0.033% 2-methyl-1-naphthylacetic acid, 0.013% 2-methyl-1-naphthylacetamide, 0.057% indole-3-butyric acid (growth promoters) and 4.00 thiram (fungicide). It is manufactured by Amchem Products, Inc. Its use does not imply recommendation by the U. S. Government.

in favor of using the live green sphagnum for cuttings. The sphagnum remains green for several months, and, like all living green plants, consumes carbon dioxide and provides a supply of oxygen in the bag. With natural temperature fluctuations, a type of mist or fog culture is provided the cuttings. By far the biggest advantage of this method is the fact that a minimum of care is required. If the bags are watertight, no watering is required for several months. An occasional inspection and removal of the rooted cuttings is about all the care required, once the cutting bag has been properly prepared and positioned. As soon as several roots have formed the cutting is transferred to a good potting soil and kept moist. Here again plastic bags may be helpful to prevent too rapid loss of water from the pots, particularly if carried out under the hot and dry atmospheres of a living room, dry cellar, or an apartment. In any case care must be taken to provide ventilation in the bag so that fungus growth is not encouraged.

Young, recently matured green wood has been necessary for success in this method. Cuttings of wood several years old did not form roots. *Camellia japonica* 'Elegans,' *C. hiemalis* 'Showa-no-sakae,' and *C. Sasanqua* 'Texas Star' and 'Jean May' were rooted by this technique.

The method has also been very useful for rooting of American holly, azalea, and rhododendron. Young green shoots taken from azalea branches in full bloom rooted by July 4. American holly started July 5 rooted in seven weeks. The method has been tried on only a few other plant types. Initial experiments with laurel, rose, and Japanese maple were unsuccessful, although some laurel cuttings did form callus tissue.

In summary, the use of live green sphagnum moss enclosed in plastic film has been found to be a good medium for the rooting of cuttings of camellia and other broad leaf evergreens. The particular advantage of the technique is the minimum care and equipment required. Large quantities of cuttings could probably be accommodated by placing the sphagnum and cuttings between large plastic sheets with edges tightly sealed.

Let's Brag About Our Arboretum Units*

IN February, 1958, Dorothy Schwager called together a group of women all of whom were strangers to each other, but all having a common desire to learn more about plant material in general and to translate that common interest into active support of the University of Washington Arboretum. That group became Unit 29. From a small nucleus of approximately ten members Unit 29 has grown until we now have twenty-one on our roll. Three are temporarily inactive due to geographical distance or illness. The eighteen active members participate in greater or lesser degree as time, physical ability and family responsibilities permit.

As we have grown to know and understand each other, we have also grown in botanical knowledge, fulfilling our first need, for it was initially determined that this was to be a member-participation study group. Taking a cue from the Unit Council meetings, each unit meeting has consisted of a short period devoted to horticultural material, a paper prepared by a member or members on prescribed subject areas (outside speakers being a rare exception to this), and a question and answer period.

Our second purpose for being, that of supporting the Arboretum, has not been neglected. Each year members of the unit have assisted in both Work-and-Fun Day and in preparing for and actually selling at the plant sale. Some members have done individual plant propagation for contribution to the sale. Our financial support of the Arboretum has gone largely to the library. We feel a book's potential for enriching lives is immeasurable and our rather small contribu-

*An entry for the Thorgrimson Cup.

tions can be more effectively shared with others in this manner. Two of our members presently serve on the Unit Council Board, one as Northeast representative and Assistant Membership Chairman and one just completing her term as 3rd Vice-Chairman, in charge of the greenhouse.

Greenhouse records indicate that Unit 29 has averaged at least sixteen hours of work each month. To this could be added many hours of unscheduled work for which no record is kept. Approximately two-thirds of the group members have actively participated in the project. This work has included all phases of the routine greenhouse maintenance chores such as pot scrubbing and sorting, label cleaning, bench cleaning, watering, spraying and fertilizing, and soil preparation from composted stage to potting bins. Especially rewarding activities have been those associated with propagation of material from cuttings, through one or more potting stages, then to cold frame and lathhouse and finally to the plant sale. Some of the heavy lifting led us to purchase for the greenhouse a $50.00 stainless steel cart to facilitate movements of pots and plants. Similarly, as needs have arisen, the unit has purchased other equipment, such as a sprayer and assorted garden tools. One member donated a hose, another a large metal pan which has become indispensable in watering and moving newly potted plants.

The effect of this involvement during the past two years has been multiple. It has greatly stimulated the interest of our members in the educational courses offered by the Arboretum. The increased knowledge of plant material gained in the greenhouse has made us more effective salesmen at the plant sale as well as more effective spokesmen for the Arboretum. Finally, a more intangible benefit to our group has been that unifying force that comes from working together. The project has helped delineate and define areas of future study for the unit. For example, it has brought about the desire on the part of the group to learn more about rhododendrons and to propagate and raise them for the Plant Sale. To insure continuance in greenhouse activity, Unit 29 is hopeful it will be given permission by the new Greenhouse Chairman to assume the responsibility of this area of plant propagation for future plant sales. Unit 29 is also hopeful that submission of this application will serve to call the attention of other groups to an activity in which all may participate—one which carries endless potential for growth as well as service to the Arboretum.

Ceanothus Damage, January 1963

DESPITE their predominantly Californian origin most Ceanothus grow well in the coastal areas of the Pacific Northwest if they are carefully placed and if the winters stay averagely moderate. The cold weather of January this year (with a minimum of 14°F.) was a good winter hardiness test of the species and hybrids growing in the Arboretum.

The main collection is on a gentle southwest facing slope northwest of Rhododendron Glen, with a small group on a steep west bank on the east side of Azalea Way a few hundred yards north. Others are used as wall plants around the south and west walls of the office and greenhouse. They all have good drainage, nearly full exposure to the sun, and none receive any other than natural irrigation.

Generally speaking the *Ceanothus* rode out the cold very well, the only complete casualties were some small plants which were not well established and whose demise might have been due to some other cause than cold. Most of the larger bushes when examined in mid-April showed foliar damage to some extent, varying with the species, but very few indeed had flower buds blasted and all were making what appears to be a quick smooth recovery.

Certain species and their hybrids were very noticeably subject to cold damage. These include *Ceanothus arboreus* hybrids, *C. griseus* and its hybrids and certain strains of *C. thyrsiflorus*. It now regrettably seems that *C.* 'Blue Cushion,' a lovely little bun of green that has been planted out for about six years, may not recover. Among others with badly cut branches or which were nearly defoliated

were 'Autumnal Blue,' 'Sierra Blue,' 'Sky Blue' and 'Mary Lake,' *C. thyrsiflorus* (some strains) and an unnamed hybrid of *C. griseus*. These were all large, well established plants, many over eight feet tall and planted between 1956-1958.

Another group with less obvious cold damage but which still gave evidence of winter burning mainly by minor defoliation or in loss of short sections of soft new growth were *C. thyrsiflorus* (some strains), *C. papillosus, C. griseus,* 'Royal Blue,' *C. impressus* 'Puget Blue,' and *C. rigidus*. A third group which included *C. gloriosus* and its forms, *C. burtonensis, C. integerrimus, C. incanus* and *C. velutinus* were either undamaged or had very minor shoot or leaf burn.

J. A. W.

The Arboretum Library

*Books About Shrubs**

THE books included in this list have been acquired by the Arboretum since Spring, 1957, when the last list of shrub books was published.

Camellia, Its Appreciation and Artistic Arrangement, Choka Adachi. Koyo Shoin Co. Ltd., Tokyo, Japan, 1960. History, cultivation, customs, bonsai and flower arrangement of Japanese camellias. Many color photographs.

American Camellia Year Book, The American Camellia Society, Gainesville, Florida. Volumes for the years 1955 to 1963, inclusive. Excellent information on the genus, from its history to the newest hybrids.

Camellias in the Huntington Gardens—Vol. III, William Hertrich. Huntington Library, San Marino, Calif., 1959. Observations on their culture and behavior, and descriptions of cultivars. Mr. Hertrich brings his monumental work on this genus to a close, with this third and final volume. Here we find an additional two hundred varieties of *C. japonica* and a section on *C. Sasanqua*. A most helpful feature is the cross referencing of all synonyms.

A Revision of the Genus Camellia, J. Robert Sealy. Royal Horticultural Society, London, 1958. Taxonomic position of the genus *Camellia,* arrangement of the species in sections, geographical distribution, excellent line drawings.

The Camellia—Vol. I, Beryl Leslie Urquhart, Leslie Urquhart Press, Sharpthorne, Sussex, England, 1956. History of the introduction of this genus into cultivation in Europe, Great Britain, America, and Australia. All but two of the magnificent color-plates are of *C. japonica* cultivars. Illustrations by Raymond Boothe and Paul Jones.

The Camellia—Vol. II, B. L. Urquhart. Leslie Urquhart Press, 1960. Synonyms, history, descriptions of *C. reticulata,* some new American cultivars of *C. japonica,* and several other outstanding varieties. Color-prints from paintings by Paul Jones and Raymond Boothe.

Rhododendron and Camellia Year Books—1954-63, excepting 1955, Royal Horticultural Society, London. The last word on rhododendrons and camellias, in Great Britain and other countries where they are grown, collected each year by R. H. S. Committees.

Rhododendrons for Your Garden, American Rhododendron Society, Portland, Oregon, 1961. Useful information on Rhododendron species and hybrids, descriptions of species most often grown in American gardens; hardiness, bloom, and habit-ratings; lists of rhododendrons grown in specific American arboreta and botanical gardens.

Rhododendrons and Azaleas, Clement G. Bowers. Second edition, Macmillan, New York, 1960. Extensively revised and completely reset edition of the 1936 work. Two new color-plates of fifteen additional species and ten hybrids, not previously shown. New information on nutrition, physiology, and propagation, distribution maps on endpapers.

Getting Started With Rhododendrons, J. Harold Clarke. Doubleday, Garden City, N.Y., 1960. Down to earth information (origin, uses, soil requirements, general needs), including lists of species and varieties. A basic primer for the rhododendron tyro.

The International Rhododendron Register, Dr. H. R. Fletcher. Royal Horticultural Society, London, 1958. Compiled by the International Registration Authority—a group of rhododendron authorities who compile, maintain, and publish names of cultivars. New names are presented to this group and, if they conform to the rules and recommendations of the International Code for Nomenclature of Cultivated Plants, they are entered in this Register, with the name of the seed parent, pollen parent (if known), raiser, year plant first flowered, and a brief description.

The Rhododendrons of Sikkim-Himalaya, J. D. Hooker, Reeve and Co., London, 1849-51. One of the great classics in the study of rhododendrons. Thirty-three hand-colored plates of some of the members of this genus, collected by Dr. Hooker during a government botanical mission to this region of India, and some botanical information.

Rhododendrons of the World, David Leach. C. Scribner's Sons, New York, 1961. An authoritative treatment of the genus *Rhododendron.* Horticultural information, distribution maps, colored chart of floral types, excellent line drawings of leaves and floral parts of typical species in the Series. A fine reference work for the rhododendron enthusiast.

The Azalea Book, Frederick P. Lee. D. Van Nostrand Company, Princeton, N.J., 1958. A complete and authoritative handbook. History, descriptive lists, tested methods of selection,

*The Editorial Board and our readers are greatly indebted to Mrs. Page Ballard for assembling this useful information.

planting, cultivation of azaleas. Illustrated in color and black-and-white.

Proceedings, International Rhododendron Conference, American Rhododendron Society, Portland, Oregon, 1961. Papers presented by rhododendron authorities, including six from foreign countries, during the conference held from May 11-14, 1961, in Portland, Oregon.

The Rhododendron, Beryl Leslie Urquhart. Leslie Urquhart Press, Sussex, England, 1958. History of introduction of rhododendron species by early collectors. Descriptions and handsome illustrations in color from paintings by Carlos Reifel.

Modern Roses V, Roy E. Shepherd, et al., American Rose Society. J. Horace McFarland Co., Harrisburg, Pa., 1958. Revised by Mr. Shepherd (Chairman of the Classification Committee of the American Rose Soc.), and others. Basic information on all roses of current interest, simplified classification, chromosome counts for students and hybridists.

Old Garden Roses—Part I, Sacheverell Sitwell and James Russell. George Rainbird Ltd., London, 1955. History of old garden roses, with horticultural notes on main groups, and their characteristics. Beautiful color plates; foreword by Graham Thomas.

Old Garden Roses—Part II, Wilfred Blunt and James Russell. George Rainbird Ltd., London, 1957. The rose in literature, the Gallica roses, and many fine color plates.

Les Roses des Alpes Maritimes, E. Barnat and A. Gremli. 1879, June 1882-1883. French text.

Old Roses, Mrs. F. L. Keays. Macmillan, New York, 1935. History of Old Rose types, the Colonial Rose Period, the China Rose Period, the hybrid Perpetual Rose, collecting and recording, and uses for Old Roses.

Shrubs of West Virginia, Nelle Ammons. W. Virginia U. Bulletin, Morgantown, W. Va., 1950. Small handbook of shrubs native to the area, with descriptions, line drawings, and keys to the identification of the species.

Berberis and Mahonia—A Taxonomic Revision, Leslie Walter Allam Ahrendt. *Journal of the Linnaean Society of London*—Vol. 57. Burlington House, Piccadilly, 1961. Comprehensive monograph of these two closely related genera. Botanical keys, descriptions of species, sixty-seven text figures and fifty-one maps.

The Results of the Introduction of Trees and Shrubs in the Nikitsky Botanical Garden for Thirty Years (1926-1955). Editors: Prof. Dr. N. I. Rubtzov and A. M. Kormilitzyn. Jalta, 1957. Russian text, with English summary.

Ornamental Shrubs of California, Leonid Enari. Ward Ritchie Press, Los Angeles, 1962. Includes both native and introduced plant material, common names given preference; keys based on color of flowers, number of petals, sepals, stamens and pistils, and the form and arrangement of leaves; line drawings of leaves. Excellent for beginners.

Garden Shrubs and Trees, S. G. Harrison. St. Martin's Press, New York, 1960. Key to the Genera—R. D. Meikle; Colour Illustrations—A. V. Webster; Text Illustrations—Ernest Petts. A most practical little handbook for those who would like to know more about the botanical aspects of some of the more commonly grown trees and shrubs.

Landscaping with Vines, Frances Howard. Macmillan, New York, 1959. *Part I* describes the many uses of vines; *Part II* contains descriptions of three hundred and fifty species, with specific information on planting, watering, fertilizing, spraying, supporting and pruning. Forty-four drawings, twenty-eight half-tones, and an illustrated glossary.

Northern Rocky Mountain Trees and Shrubs, J. E. Kirkwood. Stanford U. Press, Palo Alto, Calif., 1930. Information on plant material from an area not familiar but interesting to many of us.

Trees and Shrubs of Japan, Siro Kitamura and Syogo Okamoto. Hoikusha, Osaka, Japan, 1960. Quantities of beautiful, colored photographs of such fine quality as to make the garden enthusiast greedy to grow every plant pictured. Text in Japanese, plant names in Latin.

Handbuch der Laubgeholze, Gerd Krussman. Paul Parey, Berlin, 1959. Two volumes, unbound. German text, Latin nomenclature. Woody plants arranged alphabetically by genera, some subdivided into sections and sub-sections. Covers cultivated ornamentals not found in most reference books. Extensively illustrated with line drawings and photographs.

The Lilac, A Monograph, Susan Delano McKelvey. Macmillan, New York, 1928. History, distribution, and description of the genus and its sections. A key to the species, descriptions of species and varieties, culture, propagation, pruning, diseases and pests. All of this, and one hundred and seventy-two half-tone plates and four full color charts. Many illustrations of winter buds, as well as flowering branches.

Mexican Flowering Trees and Plants, Helen O'Gorman—edited by Ella Wallace Turok. Ammex Associados, Mexico City, 1961. Very well executed color plates. Descriptions of species, status of genera in Mexico; use of plants, economically and medicinally. A handsome volume.

Garden Plants in Color—Vol. I, *Trees, Shrubs and Vines,* edited by Dr. Henry T. Skinner. Sweeney, Krist, and Dimm, Portland, Oregon, 1958. Four hundred and thirty-eight full color illustrations of trees, shrubs, and vines available for use in home, avenue, and park plantings.

The Heather Family of British Columbia, Adam F. Szczawinski. Handbook No. 19, published by the British Columbia Provincial Museum, Victoria, B.C., 1962. Quite applicable to Washington, and a delightful addition to the library of anyone interested in ericaceous plants. Fine black and white drawings by Betty Newton and Ann Hassen.

Trees, Shrubs, and Vines, Prof. A. T. Viertel. College of Forestry, Syracuse University, New York, 1959. Pictorial guide to ornamental woody plants of Northeastern U.S.A. (exclusive of conifers). Scale drawings in black-and-white, hardiness ratings, zone maps, bibliography, glossary.

Trees, Shrubs and Woody Vines of the Southwest, Robert A. Vines. University of Texas Press, Austin, 1960. Descriptions and illustrations of more than 1200 species of native and naturalized woody plants of Texas, New Mexico, Oklahoma, Arkansas, and Louisiana. Twelve hundred and thirty-one species arranged in one hundred and two chapters, by plant families. Outstanding botanical drawings.

Groundcover Plants, Donald Wyman. Macmillan, New York, 1956. A virtual encyclopedia of groundcovers. Deals with more than two hundred kinds of woody plants and herbaceous perennials; planting, growing, hardiness, pruning, and propagation. A most useful book.

Some of Our Favorites☆ ☆Won't You Send Us Yours?

Pittosporum Tobira

EVERY city garden has at least one area which gives the owner real concern. Ours is a west wall of the house in full sun, just outside the dining room window. An evergreen planting is indicated for year round enjoyment yet rhododendrons and camellias do not thrive in this unshaded location. In seeking other decorative evergreens we came across *Pittosporum Tobira* and have been completely satisfied with its performance. It is never exotically beautiful but also it is never "past its prime." It can be counted upon in the dead of winter as well as the rest of the year to be upright, unshedding and shiny. *P. Tobira* is a native of Japan and China and, as is the case with so many Orientals, flourishes better in California. However, the University of Washington Arboretum has a fine specimen and there are several other fine old plants in the Northwest.

Our plant is about five feet tall, quite symmetrical and attractive. It has leathery, dark green shiny leaves, paler underneath. The texture is almost succulent, making a good contrast with most of our other evergreens. The blossoms are fragrant, whitish yellow, in terminal umbels, not too dissimilar from orange blossoms. They occur in late May and early June. Ours does not bear fruit, but those that do produce yellow fruit. The flowers apparently are more profuse and larger in California, but the other merits of the plant are sufficient reason to give it an honored place in a city garden. Nothing seems to bother it, so no spraying is needed and slugs aren't interested either. It blends nicely and gives an interesting contrast with many other evergreens. Our planting is with other sun-loving shrubs, *Raphiolopis* and *Viburnum Davidii.*

MRS. ROLAND PINKHAM

Prunus subhirtella 'Autumnalis'

WERE I to have but one small tree in my garden, surely it would be the winter blooming cherry *(Prunus subhirtella* 'Autumnalis').

The small semi-double flowers might be blush pink or a deeper rosier shade. The first blooms appear before the last leaves drop from the tree in October, and the last come when the new foliage opens in April. All through the winter months there is bloom—lots of it—whenever the weather turns mild for a few days.

Without bloom *Prunus subhirtella* 'Autumnalis' is an appealing little tree, twenty to twenty-five feet tall. The branching pattern is twiggy and open. The overall effect is dainty and refined.

At the base of the winter blooming cherry I like to see *Rhododendron* 'Rosamundi,' with primrose 'Wanda' in the foreground. That's a picture you'll never forget!

JEAN WILCOX

Lilies in the Border

(Continued from Page 36)

will show you what to expect, but there are other suitable shrubs nearby. *Kalmia latifolia* is a close runner-up to rhododendron. *Arctostaphylos montana* (manzanita) and *Leucothoe axillaris* are growing near the fence and I saw *L. Martagon* planted with them. *Hypericum prolificum* is a stout, dense shrub to five feet. *Hebe* is in several varieties, mostly low growing. *Magnolia stellata* and *Photinia Fraseri* bloom early. *Photinia glabra* has bright red growth in the spring. *Viburnum tomentosum* bears bronze foliage in the fall. *Euonymus alatus* with pink berries becomes scarlet in the fall. And you may find others that you prefer.

The Arboretum Bulletin

VOL. XXVI, No. 2 SEATTLE, WASH. SUMMER, 1963

ARBORETUM FOUNDATION
OFFICE HOURS
9 a. m. to 4:30 p. m.
Monday through Friday
Phone EAst 5-4510

Special Notice

To keep memberships in the Arboretum Foundation in good standing, dues should be paid during the month payable. Active memberships more than three months in arrears will be dropped and THE BULLETIN will be discontinued.

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The Arboretum Foundation,
University of Washington Arboretum
Seattle 5, Washington

I hereby apply for membership in the Arboretum Foundation and remittance for same is enclosed to cover dues for the next succeeding 12 months.

Name .....

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All memberships are non-assessable.

Oliver B. Thorgrimson Cup

MEMBERS of the award committee this year comprised Mrs. Estes Williamson and Mrs. Clyde E. McDonald, of Unit No. 49; Mrs. Amos Wood, Mrs. Nils Rosenberg and Mrs. Albert Brauss, representing the Unit Council; and the Director of the Arboretum and Executive Secretary of the Arboretum Foundation, ex officio.

A meeting was held at the Arboretum on May 2 to consider three entries for the trophy, awarded annually to the Unit which has performed the greatest service to the Arboretum during the previous calendar year.

It was the unanimous opinion of the committee members, based on the submitted reports, that for 1962 the cup should be awarded to Unit No. 32, the Mountaineers, whose work included 82½ hours spent in weeding the rock garden, 129½ hours given to the two Work-and-Fun Days in April, with considerable time as well as plants donated to the annual sale in October by seven members, some of whom also worked in the Unit Council greenhouse and participated in the guide training program. The sum of $30.00 was raised and donated to the Arboretum.

Runner-up was Unit No. 29, whose members also participated in Work-and-Fun Days, the plant sale, and did considerable work in the greenhouse, to which they contributed several useful items of equipment, including a stainless steel cart. A detailed account of this Unit's formation and activities appears elsewhere in this issue of the *Bulletin*.

The third Unit, No. 20, the Heatherbelles, performed a most useful task in the Arboretum office, transferring planting records from the original foreman's sheets to our planting books, which occupied 68 hours during 1962 and brought them almost to the end of that year's new plantings. We hope they will continue during 1963, thus relieving our staff of a time-consuming but very necessary job.

The committee would like to see more entries for this handsome trophy in the present year, since there are many helpful tasks which can be carried out, as these reports indicate. The Director especially wishes to

express the gratitude of the Arboretum staff for all that was accomplished by these and other willing workers in 1962, thus making it more of a community project and giving many individuals a sense of personal sharing in the functioning and appearance of our Arboretum.

A regular weekly program from the Arboretum has been arranged by KCTS-TV (Channel 9), on Monday evenings at 8 p.m., starting June 24.

This series will be directed by Mr. George W. Mally, senior director of KCTS-TV; various features of the Arboretum will be described and discussed by the Director, using either fresh plant material or slides for illustration whenever possible. The first program will be A Midsummer Tour of the Arboretum; others will deal with such subjects as Summer-flowering Trees, and Shrubs, with Heathers, Hydrangeas, Propagation, Planting amongst Shrubs, etc.

It will run for twelve weeks, omitting Sept. 2, and conclude Sept. 16.

At the annual meeting of the Western Chapter, International Shade Tree Conference, held at Las Vegas, Nevada (May 13 through 15), Mr. Brian O. Mulligan, Director of the University of Washington Arboretum, was elected President of the Western Chapter for the ensuing year. This Chapter now has the second largest membership (310) of the seven in the Conference.

At the Annual Membership meeting of the Arboretum Foundation, held June 6, 1963 the following were elected officers of the Foundation—Donald G. Graham, President; M. C. Collarino, Vice-President; Donald K. McClure, Vice-President; Mrs. Rex Palmer, Vice-President; Mrs. John A. Clark, Vice-President; Mrs. Henry Schmitz, Secretary and Charles W. Callahan, Treasurer. New active members of the Board of Directors elected for a one-year-term were: Mrs. C. Spencer Clark, Mrs. Lawrence J. Pierce, Frank M. Preston, Gordon N. Scott, Mrs. Robert W. Sprague and Howard H. Wright.

The Bonsai Arboretum Unit No. 73 will again hold classes in Bonsai culture beginning in the Fall and continuing in early Spring. Beginners and Intermediate classes are scheduled. Call the Foundation office (EAst 5-4510) for further information.

This is your Arboretum, kept alive by your support

We are pleased to welcome the following new members (March 7, through June 7, 1963): *Sustaining* — East Lake Washington District of Garden Clubs, Evergreen Point Garden Club, William P. Ford, Dr. and Mrs. H. L. Hartley, Hilltoppers Garden Club, Mrs. Ted J. Morgan, George E. Riley. *Annual* — Mrs. John Ademino, Mrs. Leo A. Anderson, Mrs. William Y. Baker, Mrs. Leonard B. Barlow, Mrs. J. E. Beardsley, Mr. and Mrs. Bruce W. Butterworth, Mrs. Ronald Christie, Mrs. J. L. Colburn, Mrs. Vincent J. Davis, Mrs. D. P. Doell, Mrs. R. G. Elsner, Mrs. Aaron Freed, Mrs. Wellington Groves, Mrs. John R. Gulbranson, Mrs. R. H. Gustafson, Mrs. Joseph J. Harnish, Mrs. Robert E. Hascall, Andrew D. Hawley, Mrs. C. L. Hoover, Howard Hughes, Mrs. James D. Hunter, Mrs. Kenneth A. Kander, Mrs. Warren B. Ludwig, Mrs. Walter T. McGovern, Mrs. Fred W. McIlroy, Mrs. John Meares, Mrs. Sam Miller, Mrs. Guy M. Mitchell, Mrs. Charles Morris, Mrs. Andrew Nagy, Jr., Mrs. W. Niemiec, Mrs. Harry C. Olsen, Mrs. James M. Owen, Mrs. John T. Pascoe, Mrs. Don E. Peterson, Mrs. J. N. Pomeroy, Mrs. M. F. Potter, Mrs. Ruth R. Reynolds, Samuel J. Rich, Mrs. R. H. Schairer, Mrs. Gary W. Sherman, Mrs. H. Martin Smith, Jr., Mrs. Willard W. Smith, Mrs. C. F. Sutter, Mrs. Roy F. Taylor, Mrs. Phyllis E. Turay, Mrs. Elgin C. van Sickle, Mrs. O. Wildermuth, Mrs. Jack D. Wilkins, Mrs. Michael Zimmerman.

We are also most grateful to the following members who have raised their dues to: *Sustaining*—Mrs. Thomas Macbride, Mrs. E. L. Vinal, Mrs. Tedrowe Watkins.

BOOK REVIEWS

A Handbook of Wild Flower Cultivation, by Kathryn S. Taylor and Stephen F. Hamblin, The Macmillan Co., New York, 1963. $5.95.

AS I read this guide to growing wild flowers I felt rather resentful that it had not been written in the thirties (when I started my wild flower garden), instead of the sixties. The book is full of valuable information. I had a perfect location for trailing Arbutus in my woods but it never reproduced itself with seedlings. I learned here that "ants eat the seeds."

As a matter of course the authors emphasize the importance of knowing the natural habitat of each of the wild plants he is bringing into a cultivated garden and the necessity of duplicating the soil and position as nearly as possible in which they were originally found. Nevertheless the gardener may send for seeds or plants he has never seen although they may be vivid memories of older members of his family; the reader will find long lists of descriptions of wild flowers, listed by families, where they grow on their native heath, the soils and positions they prefer and how they may be propagated. There are rules for composts and fertilizers to use in seed flats; hints on the necessity of not disturbing the soil where self-sown seeds may develop, protection from heavy rainfall; the necessity of quick eyes to see the difference between seedling and unwanted weeds and grasses.

There are descriptions for growing seeds and the many methods of successful, well-known growers. Think of the joy of growing fringed gentian seeds in the kitchen window in jars with screw tops! There are recommendations for growing wild flowers from cuttings.

To quote from the wrapper on the book: "With more and more people doing their own gardening, many gardeners are finding that the naturalistic type of planting is easier to care for and more rewarding than the more familiar rose garden or perennial border. There is much yet to be learned, however, and the aim of this book is to present as much information as is now possible on this important subject."

GRACE T. DOWLING

* * *

Flowering Trees, by Robert B. Clark, D. Van Nostrand Co., Inc., Princeton, N. J., 1963. $6.50.

THE first chapter of *Flowering Trees* states the most important facts and reasons for successful tree placing. Trees frame the house, giving an air of dignity and permanence besides making beautiful garden pictures. If well chosen, trees give a succession of bloom and fragrance. The beauty of distinctive foliage and fruits should be considered. The manner of the tree's growth is important. There is a whole chapter on "Horizontals in Dogwoods."

The author can tell us little about the beauty of magnolias. Every gardener within a large radius of the Arboretum knows their magnificence. But there are interesting directions for placing them, with beautifully colored pictures of magnolias, showing the tree's various forms. There are lists of trees and these are not merely a collection of names but descriptions with conversational connotations charming to a gardener. The whole book is a pleasure to read as a story as well as for information.

The author explains the knowledge found in the book is the "fruit and generosity of many patient and talented individuals"; the reader feels the authority of its background.

Every gardener will want to own *Flowering Trees* for reference, information, and the downright pleasure the book gives him.

GRACE T. DOWLING

* * *

A Checklist of Woody Ornamental Plants of California, by Mildred E. Mathias and Elizabeth McClintock—Manual 32, California Agricultural Experiment Station Extension Service. April 1963, Price 75c.

THE laws of California require that all woody plants sold as ornamentals in nurseries, except for roses, shall be labeled with their scientific name. This is a most civilized law, but one that could work a hardship on nursery people who have been using the common name of their plants and might not be familiar with the correct scientific epithet. In order to help the nurseryman attach the correct label to his plants this sixty-five page pamphlet lists the scientific and common name, cross-indexed, and synonyms of most of the woody ornamentals offered by California nurseries. There are fifty-four double columns of plant names which include many commonly cultivated in the Northwest as well as many found only in California. The authors are outstanding taxonomists from U.C.L.A. and the California Academy of Sciences in San Francisco, respectively.

J.A.W.

The Ageless Relicts by Norman Taylor. St. Martin's Press, New York, 1962; price $3.95

A SLENDER book of around a hundred pages, well illustrated, offers the reader a delightful history of the *Sequoia,* giant of antiquity. It also includes many colorful episodes of California history in the telling. From the discovery of the Coast redwoods *(Sequoia sempervirens)* by two Spaniards, members of the Portola expedition in 1579, to the Gold Rush of 1849, when shortly thereafter hunters from adjacent mining camps stumbled on the now famous Calaveras Big Tree Grove in the Sierras, and gave to the world the *Sequoia gigantea,* the history of these marvels of nature continues to the present.

The story of their exploitation and ruthless destruction, which started with their discovery and continued unabated until 1920, makes one realize how nearly these great trees were lost to posterity. You cannot help but feel a deep sense of gratitude to the group of thoughtful men, who, determined to preserve what was left of this priceless heritage, took their cause to the nation and helped prevent further holocaust.

Details of the origin and physical characteristics of these forest giants and the unravelling of their antiquity by scientists will be of interest to all tree lovers and amateur botanists. A useful list of the largest and most accessible groves will prove valuable to those planning to visit these areas and an excellent bibliography furnishes additional sources for the further exploration of this fascinating subject.

MRS. A.A. NAEF

New or Unusual Shrubs in the Arboretum

(Continued from Page 42)

the ends of long felted peduncles held out and above the base of the plant and are about two and one-half inches across, white with a yellow-brown eye. (Fig. 8). Actually the "flower" is composed of many florets, the outer or ray flowers are white and form the "petals," the inner or disk flowers form the eye. We have not set any seed on our plant yet but perhaps we shall this summer.

Although I could find no common name for this attractive and unusual shrub, an indication that it is either very rare or not considered worth naming by the layman, one New Zealander thought very highly of it. T. F. Cheeseman, certainly one of that country's leading botanists, wrote the following in his *Manual of the New Zealand Flora,* (2nd ed., 1925), "A very handsome and remarkable plant quite unlike any other. Although New Zealand contains many beautiful shrubby composites, it may be doubted whether any one of them is more deserving of notice than the plant described above. Its peculiar habit, the excessively thick and coriaceous leaves with their shining upper surface and dense coating of white tomentum beneath, the tall stout peduncles each with its single bold head, and the large broad involucres with their many rows of bracts are prominent and noteworthy characters; while the general appearance of the plant is singularly attractive."

We can but agree.

Winter Damage at Callaway

(Continued from Page 49)

(A) Killed to ground

Arbutus Unedo, Camellia hiemalis forms, including 'Showa-no-Sakae' and 'Usu Beni'; *C. Sasanqua* 'Mine-no-Yuki', 'Orchid', and 'Rosea'; *Cotoneaster lactea, C. pannosa; Choisya ternata* (in some places); *Eriobotrya japonica,* the loquat; *Idesia polycarpa; Ilex dipyrena, I. integra; Ligustrum lucidum; Lonicera nitida* and *L. pileata; Mahonia lomariifolia* and *M. Fortunei; Michelia fuscata; Pyracantha formosana, P. crenato-serrata, P. 'Low Dense'; Viburnum cinnamomifolium, V. odoratissimum, V. Tinus.*

(B) Medium damage

Ardisia japonica; Acer oblongum; Camellia Sasanqua 'Miss Auburn', 'Papaver', 'Peach Blossom', 'Velvety'; *C. vernalis* 'Dawn'; *Prunus Laurocerasus; Pyracantha* 'Santa Cruz'; *Viburnum Davidii.*

(C) Slight damage

Aucuba japonica; Berberis Julianae; Camellia Sasanqua 'North Star', Choji-Guruma', 'Cleopatra', 'Crimson Tide'; *Ilex Aquifolium* var., *I. chinensis, I.* 'San Jose'; *Mahonia japonica; Osmanthus Fortunei;* Rhododendrons—a number of clones suffered bud damage but few damage to stem or foliage ('Alice' and 'Princess Elizabeth').

(D) No damage

Camellia oleifera; C. Sasanqua, fifteen clones including 'Cherry Blossom', 'Jean May', 'Hiodoshi', 'Narumi-gata', 'Maiden's Blush', and 'Setsugekka'; *Cotoneaster conspicua* and *C. horizontalis; Ilex cornuta, I. glabra, I. latifolia, I. opaca; Mahonia Bealii; Osmanthus americanus, O. heterophyllus (O. ilicifolius); Pyracantha,* eleven clones or species, including 'Graberi', 'Watereri', and 'Government Red'.

We are very much indebted to Dr. J. M. Fogg, Jr., and Mr. F. C. Galle for their respective articles on the damage caused to their plant collections by last winter's weather, so much more severe than our own.

Rhododendrons for the Rock Garden

(Continued from Page 46)

R. scintillans (sparkling)—*Lapponicum*—Yunnan. The F.C.C. form of this is as lovely a blue as one can find. Some forms are pale and dingy.

R. scyphocalyx (cup-shaped calyx)—*Neriiflorum*, sub-series *Sanguineum*—N.E. Burma and W. Yunnan. Another ornamental bush, with rather easily overlooked, rosy-marmaladish, tubular flowers — very like *R. herpesticum*. There are much worse forms than the jammy, marmalade one—some pure blackstrap molasses.

R. semilunatum (half-moon shaped)—*Trichocladum*—Tibet. A deciduous, yellow-flowered species—very pretty. Name refers to the style.

R. serpyllifolium (with leaves like thyme) — *Azalea*—Cent. and S. Japan. A very small, rather tender azalea, with tiny leaves and small pink flowers. There is a white form which is less attractive in habit.

R. sperabile (to be hoped for)—*Neriiflorum*—N. E. Upper Burma. This varies considerably in size. This particular plant is only a couple of feet high but thirty years old. It is smaller in leaf than some forms and heavily clothed with white hairs on the upper surface; the under surface is tawny. It is free-flowering and bright red.

R. sperabiloides (like *R. sperabile*)—*Neriiflorum*—S.E. Tibet. Not unlike the preceding plant, except that it has no indumentum nor hairs on the upper surface. It is decidedly hardier here, too. It is also a more dense bush, with bright red flowers.

R. spinuliferum (bearing spines)—*Scabrifolium*—Yunnan. This is really a conversation piece and possibly not hardy in Seattle. The red color is lovely and quite striking.

R. telopeum (*conspicuous*)—*Thomsonii*, sub-series *Campylocarpum*—N. Burma. (K.W. 20927). This is a beautiful little plant, with leaves as pretty as the flowers, and a good habit. It is slow-growing, and flowers early in life, for a *Thomsonii* species.

R. trichostomum (hairy-mouthed) vars. *ledoides* (Ledum-like) and *radinum* (slender)—*Anthopogon*—Yunnan. These two are very like daphnes and each other. *R. radinum* is the better garden plant, we think. Forms vary a little—from pale-pink fading to white, to (more rarely) a soft deeper-pink which holds its color.

R. tsariense (from Tsari, S.E. Tibet)—*Campanulatum*—Bhutan and S.E. Tibet. One of the most interesting leaves among the smaller rhododendrons. The thick, leathery, oval leaves are covered below with a heavy fox-red indumentum. The inflorescence is pale pink, pretty but rather a let-down after the spectacular leaves.

R. Tschonoskii (named for a Japanese collector) —*Azalea*—Japan. A midget in this garden, only about 18 in. in a poor situation, but quaint and attractive, with small whitish flowers. Good fall color.

R. uniflorum (one-flowered)—*Uniflorum*—S. Tibet. Very near *R. pemakoense*, but with much brighter and deeper, red-purple flowers in April-May.

R. Valentinianum (after Pere Valentin, missionary)—*Maddenii*—Yunnan. Bright yellow flowers and most attractive scaly and hairy leaves (the hairs bronzy), giving the whole plant a "different" look. We find it touchy here but Seattle should have no trouble with it. A very old plant here is not more than 2½ ft., in the coolhouse.

R. xanthostephanum (yellow garland)—*Boothii*—Yunnan. Formerly *R. aureum*. Another good yellow—a little on the tall side, but should be grown hard and is quite easily controlled.

R. yakusimanum (from Yakusima island)—*Ponticum*—Japan. Still not too easy to come by, but don't worry—it won't be long before every nursery has it. A most desirable little rhododendron and, apparently, a very good parent.

R. yedoense (from Yedo, Japan) var. *poukhanense*—*Azalea*—Japan. An evergreen azalea with purple flowers. Said to be sweet-scented, though I have not noticed it.

Witch-hazels of Quality

(Continued from Page 41)

also appeared in the author's garden where two parent species were standing side by side —spontaneous seedlings produced annually always proved to be hybrids.

"Plants raised showed considerable variation in the amount of the pubescence, size and shape of leaves, and the colour of the flowers—but all were intermediate between the two species."

Although Rehder discovered and named the above crosses, he was not the first to notice the intermediate characteristics of *H. mollis* seedlings, for, nearly 20 years before his discovery, Mr. Lange of the Botanic Garden, Charlottenlund (Denmark) had been raising seedlings from a specimen of *H. mollis,* also planted in 1907. The reason that he propagated from seed was that cuttings did not succeed and grafting was slow, so seed was sown in the hope that it would be self-fertile. Mr. Lange's researches have been published and the following is translated from his publication:

"The mother plant is undoubtedly a good and pure *H. mollis*—the differences (between seedlings and *mollis*) cannot be explained as a splitting in the F_2 generation—they are obviously quite different and are definitely hybrids as three *H. japonica* specimens stand nearby. A controlled pollination and back-cross ought to have been carried out, but owing to the technical difficulties of winter pollination, I have ceased trying."

Mr. Lange had published this material in 1953—calling a selection he had made from the seedlings "*Hamamelis japollis* 'Nina' "—which has since been corrected to *H. intermedia* 'Nina.' This cultivar is not so well known in this country as are the cultivars raised by Mr. de Belder. His cultivars are different in that they have arisen from seedlings of both a *H. japonica* variety and pure *H. mollis.* The following is a further extract from correspondence with Mr. de Belder:

"Some two to three decades ago Mr. Kort selected 10 seedlings from which Mr. de Belder selected 'Jelena' (a specimen of which can be seen on the left of the borders at the top of Battleston Hill, Wisley). The correct name of this plant is *Hamamelis intermedia* 'Jelena,' although it is still seen in some catalogues as *H. mollis* 'Orange Beauty'."

Hamamelis intermedia 'Jelena' was given an award of merit in 1955. The plant is characterized by large, more or less copper-coloured flowers—from a distance they have an orange appearance. The leaves are longer and more hairy on the reverse and the branchlets are less hairy than the following cultivar.

Hamamelis intermedia 'Ruby Glow' has the following synonyms: *H. japonica flavo-purpurascens superba; H. j. superba rubra; H. j.* 'Ruby Glow'; *H.* 'Adonis'; and *H. japonica* 'Hiltingbury Form.' It was the first hybrid to come from the Kalmthout Arboretum and has been in cultivation in Holland since 1939. In 1954 Mr. de Belder recognized it as the darkest form and exhibited it as *H.* 'Adonis,' but it received no award.

There is another cultivar in the British nursery trade under the name of *H. japonica* 'Carmine Red'; as yet there is insufficient information about this plant but it could possibly be another seedling of *H. j. flavo-purpurascens,* in which case it would probably be called more correctly *H. intermedia* 'Carmine Red'; on the other hand it may be a synonym of some other cultivar.

Criticism could be levelled at the lack of botanical descriptions, but as stated at the outset of this article it was not intended to enter too deeply into this aspect.

The value of witch-hazels undoubtedly lies in the wealth of winter blooms. Planted with a suitable background of evergreen trees or shrubs, their beauty can be seen to perfection and they are essential for any winter garden. Combined with some species, of course, there is the autumn colouring and scent, which on calm days can be detected yards away. Many associations with other plants have been suggested but generally it is best to grow hamamelis as specimens and where they will not need to be pruned. Underplanting with dwarf bulbs and narcissi is quite effective.

The genus does very well in open and woodland conditions. Examples of woodland conditions can be seen at Wisley and the Savill Gardens and there are open ground specimens at Kew. Hardiness is undisputed—in the frost surveys conducted by the Royal Horticultural Society after the exceptionally severe winters of 1908-9 and 1916-17, all hamamelis were recorded as uninjured.

To select the best of the genus is not difficult: the claim of *H. mollis* has already been described, but 'Coombe Wood Form' at Wisley is a definite improvement, as also is 'Goldcrest'—these two together would give a display for six to eight weeks in a good season. Unfortunately these two varieties are not yet in commerce. The best paler yellow is undoubtedly *H. mollis* 'Pallida'—the large and more closely clustered flowers surpass the paler yellow of both *H. japonica* and *H. j. superba,* but if a *japonica* type is required then *H. j. arborea* or *H. j.* 'Sulphurea' are obvious choices. A particular favourite of mine is *H. mollis 'brevipetala'*.

Of the newer hybrids *H. intermedia* 'Jelena' is a "must"—it makes a magnificent show of orange—but it has to be planted intelligently to show up its full beauty.

Of the remainder it cannot be said that they have no value, but they are more interesting to the discerning enthusiast than to the average gardener who requires a good and continuous display of colour.

How to Increase Heathers

(Continued from Page 37)

Layering

For simplicity and sure success, increase your heathers by layering. This may be done at any time of the year except frosty weather. Spring is an ideal time for putting down layers, which are usually left undisturbed for twelve months. Pull down side pieces of fairly long branches, with plenty of new foliage, and place them horizontally into the soil. Peat and sand mixed into the soil stimulate root action but are not essential as long as the soil is well broken up. It helps to bend up the branch tips and to place a rock or brick on each branch to hold it down and to conserve moisture around the layer. If the lower branches are too high above the ground, lift the heather and replant it two to four inches deeper, spreading out the branches and covering all but the tips with peaty soil or peat moss. Keep the peat constantly moist for a year, then dig up the plant and you will find each branch covered with roots. Cut it from the original root, cut the tops back hard and plant it in a sunny place in soil containing 50% peat, rotted wood, leaf mold, or old sawdust. Water the layers often the first summer, trim the tips of the branches each time they grow an inch, and watch carefully for frost heaving the following winter.

Erica carnea and its hybrids, and *Calluna* varieties layer naturally in my garden in soil which contains a large amount of sawdust. The heathers are planted deeply, with the lowest portion of the foliage resting on the soil. In April I cut the layers from the parent plant, carefully dig up the roots, trim the tops, and plant them out in the garden. *Erica ciliaris, E. cinerea,* and *E. Tetralix* are more adaptable for cuttings than layering.

Seeds

In a well-established heather garden seeds germinate naturally, but few come true to color. For this reason the varieties of *Erica, Calluna,* and *Daboecia* are best propagated by cuttings or layering. Our native species of *Cassiope* and *Phyllodoce* will come true to color. Their seeds may be gathered in late summer or fall when the seed pods turn brown. Store them in a plastic bag in the refrigerator and plant them in January or February on the surface of moist, screened sphagnum moss, which is firmed one inch thick in a covered clear plastic box. To prevent seed rot, mix the seed with a tiny amount of fungicide. Place the seed box in a north window in the house. When the seedlings are ¼ to ½″ inch tall, water them gently with half-strength Rapid-gro or Hyponex; gradually remove the cover during the next two weeks. Then transplant the seedlings one inch apart in a flat containing equal parts of sand, peat, and leaf mold, watering them in from the bottom with a solution of fungicide and the half-strength fertilizer. Cover the flat with a clear plastic tent and gradually remove it during the next seven days. Grow the seedlings in a lightly-shaded cold frame until they are large enough (about three inches in diameter) to be placed in the garden.

Division

It is very risky to split a heather into several pieces with a shovel. Most plants are grown from cuttings and thus have just one woody stem between the top and the roots. The splitting of this stem often results in the death of the plant. If the heather is grown from a layer or if its own branches have layered naturally, it can easily be divided with the hands.

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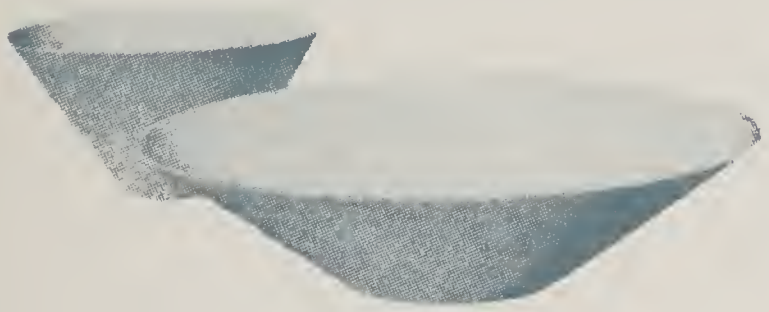

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